

Historic, archived document

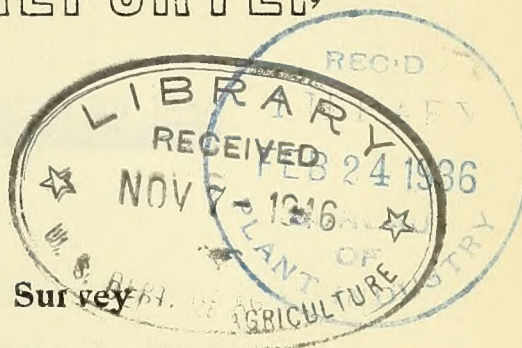
Do not assume content reflects current scientific knowledge, policies, or practices.

1. 9
P69P
suppl
cop. 2

THE PLANT DISEASE REPORTER

Issued By

Division of Mycology and Disease Survey



Supplement 90

Diseases of Plants in the United States in 1934

December 31, 1935



BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

DISEASES OF PLANTS IN THE UNITED STATES IN 1934

Compiled by

H. A. Edson, Paul R. Miller, and Jessie I. Wood

Plant Disease Reporter
Supplement 90

December 31, 1935

C O N T E N T S

	<u>Page</u>
Introduction.....	2
List of Collaborators.....	3
Weather Data.....	7
Diseases of Cereal Crops.....	17
Diseases of Forage and Cover Crops.....	31
Diseases of Fruits and Nuts.....	39
Diseases of Vegetable Crops.....	59
Diseases of Special Crops.....	89
Diseases of Sugar Crops.....	95
Diseases of Trees.....	97
Diseases of Ornamentals.....	106
Index.....	120

I N T R O D U C T I O N

Someone has said that the usual weather is the unusual. If that be true, the weather of 1934 was more unusual than usual. Extremes of temperature characterized the winter which preceded the growing season. Average means from 4° Fahrenheit to 10° Fahrenheit above normal prevailed in the northwest, while the northeastern portions of the country experienced an exceedingly cold winter with much attendant injury to trees, shrubs, and nursery stock. The month of February in particular was characterized by extremes of temperature, cold in the east, warm in the west. The normal mean isotherm for that month passed through western Wisconsin, eastern Iowa, central Missouri, northeastern Arkansas, southwestern Oklahoma, and east central Texas. East of that line diminishing means toward the northeast fell to a minimum of 16° Fahrenheit below normal in southern Maine, while western means rose successively to a maximum of 16° Fahrenheit above normal centering in northeastern Montana and northwestern North Dakota. The summer was hot and dry throughout most of the United States. The severest and most extensive drought on record accompanied by prolonged periods of excessively high temperature prevailed except in New England and in the southeastern States. Such conditions obviously afford an excellent opportunity for study of the ecology of plant diseases and it is the hope of the Survey that its records and the information presented in the summary may be of value to that end.

The 1934 summary follows closely in both form and arrangement the plan of other summaries of recent years. It has been made possible through the continued cooperation of both the official and the informal collaborators of the Plant Disease Survey. A list of the officially appointed collaborators for 1934 is given below.

The Survey and the authors of this Summary desire to express sincere appreciation of the support received from both the collaborators listed and the large number of unnamed colleagues and friends who have contributed reports and assistance to the work of the Survey during the year.

H. A. E.

LIST OF COLLABORATORS AND CONTRIBUTORS FOR THE YEAR 1934

- ALABAMA, Agricultural Experiment Station, Auburn - W. A. Gardner,
J. L. Seal.
- ARIZONA, Box 15, University Station, Tucson - J. G. Brown.
State Commission of Agriculture, Phoenix - D. C. George.
- ARKANSAS, University of Arkansas, Fayetteville - V. H. Young, H. R. Rosen.
- CALIFORNIA, University of California, Berkeley - J. T. Barrett,
M. W. Gardner, G. H. Godfrey, C. E. Scott, Harvey E. Thomas.
Citrus Experiment Station, Riverside - W. T. Horne, E. T. Bartholomew, H. S. Fawcett, and others.
Agricultural Experiment Station, Davis - J. B. Kendrick.
State Department of Agriculture, Sacramento - G. L. Stout.
Agricultural Experiment Station, Berkeley - B. A. Rudolph,
R. E. Smith.
- COLORADO, Agricultural College, Fort Collins - L. W. Durrell, E. W. Bodine.
- CONNECTICUT, Agricultural Experiment Station, New Haven - G. P. Clinton,
E. M. Stoddard.
Tobacco Experiment Station, Windsor - P. J. Anderson.
- DELAWARE, Agricultural Experiment Station, Newark - J. F. Adams,
T. F. Manns.
- FLORIDA, Agricultural Experiment Station, Gainesville - G. F. Weber,
L. O. Gratz, A. S. Rhodes, A. H. Eddins, W. B. Tisdale,
A. N. Brooks, G. D. Ruehle.
- GEORGIA, State College of Agriculture, Athens - J. H. Miller, T. H. McHatton.
- IDAHO, Agricultural Experiment Station, Moscow - C. W. Hungerford.
- ILLINOIS, University of Illinois, Urbana - H. W. Anderson, G. H. Dungan,
B. Koehler, J. W. Lloyd.
State Natural History Survey, Urbana - L. R. Tehon, G. H. Boewe.
- INDIANA, Agricultural Experiment Station, Lafayette - J. A. McClintock,
R. W. Samson.
Purdue University, Lafayette, C. L. Porter.
- IOWA, Agricultural Experiment Station, Ames - I. E. Melhus, J. C. Gilman.
Iowa State Teachers' College, Cedar Falls - C. W. Lantz.
Iowa State College, Ames - R. H. Porter.

KANSAS, State Agricultural College, Manhattan - L. E. Melchers,
O. H. Elmer, C. L. Lefebvre.

KENTUCKY, Agricultural Experiment Station, Lexington - W. D. Valleau,
R. A. Hunt, R. Kenney, W. W. Magill.
University of Kentucky, Lexington - J. S. Gardner.

LOUISIANA, Agricultural Experiment Station, Baton Rouge - C. W. Edgerton,
A. G. Plakidas, E. C. Tims.

MAINE, Agricultural Experiment Station, Orono - D. Folsom, Florence
Markin, F. H. Steinmetz.

MARYLAND, Maryland Agricultural College, College Park - R. A. Jehle.
Agricultural Experiment Station, College Park - J. B. S. Norton,
C. E. Temple.

MASSACHUSETTS, Massachusetts Agricultural College, Amherst - W. H. Davis,
O. C. Boyd, W. L. Doran, A. V. Osmun.
Market Garden Field Station, Waltham - E. F. Cuba.
Harvard University, Cambridge - C. W. Dodge.

MICHIGAN, Michigan Agricultural College, East Lansing - J. H. Muncie,
E. A. Bessey, Donald Cation, R. Nelson, H. H. Wedgworth.

MINNESOTA, University of Minnesota, St. Paul - J. G. Leach.
Agricultural Experiment Station, St. Paul - Louise Dodsall,
E. M. Freeman, E. C. Stakman.

MISSISSIPPI, Agricultural Experiment Station, A. & M. College - L. E. Miles.

MISSOURI, State Board of Agriculture, Jefferson City - I. T. Scott.
Missouri Research Museum, Jefferson City - A. C. Burrill.
University of Missouri, Columbia - W. E. Maneval, C. M. Tucker.

MONTANA, Agricultural Experiment Station, Bozeman - P. A. Young,
D. B. Swingle, H. E. Morris.

NEBRASKA, College of Agriculture, Lincoln - G. L. Peltier, R. W. Goss.

NEVADA, Agricultural Experiment Station, Reno - P. A. Lehenbauer.

NEW HAMPSHIRE, Agricultural Experiment Station, Durham - O. R. Butler.
Dartmouth College, Hanover - A. H. Chivers.

NEW JERSEY, Agricultural Experiment Station, New Brunswick - W. H. Martin,
R. P. White.
Pemberton - Thompson J. Blisard.
Rutgers College, New Brunswick - C. M. Haenseler.

NEW MEXICO, New Mexico Agricultural College, State College,
R. F. Crawford.

NEW YORK, Cornell University, Ithaca - F. M. Blodgett, C. Chupp,
H. M. Fitzpatrick, L. M. Massey, H. H. Whetzel, M. F. Barrus.
Agricultural Experiment Station, Geneva - W. H. Hankin.

NORTH CAROLINA, Agricultural Experiment Station, Raleigh - R. F. Poole,
S. G. Lehman.

NORTH DAKOTA, State College Station, Fargo - H. L. Bolley,
W. E. Brentzel.

OHIO, Agricultural Experiment Station, Wooster - H. C. Young,
R. C. Thomas, P. E. Tilford, J. D. Wilson.
Ohio State University, Columbus - A. L. Pierstorff.
University of Cincinnati, Cincinnati - O. T. Wilson.

OKLAHOMA, Agricultural Experiment Station, Stillwater - F. M. Rolfs.
307 Fifth Street, Durant - W. L. Blain.
Agricultural & Mechanical College, Stillwater - R. Stratton.

OREGON, Agricultural Experiment Station, Corvallis - S. M. Zeller.
Hood River College, Hood River - LeRoy Childs.

PENNSYLVANIA, Agricultural Experiment Station, State College -
F. D. Kern, E. L. Nixon.
Pennsylvania Field Laboratory, Bustleton - W. S. Beach.
Pennsylvania State College, State College - R. S. Kirby.
H. W. Thurston, G. L. Zundel, L. O. Overholts.

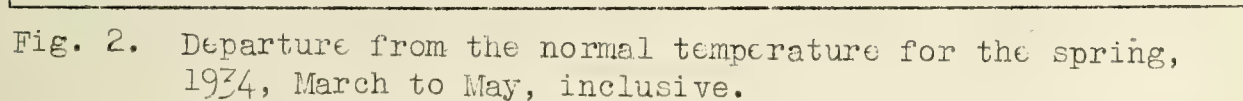
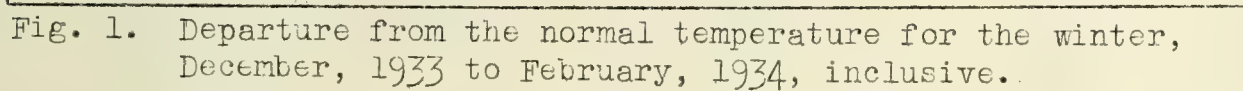
RHODE ISLAND, Rhode Island State College, Kingston - H. W. Browning.

SOUTH CAROLINA, Agricultural Experiment Station, Clemson College,
G. M. Armstrong, C. B. Sumner.
South Carolina Agricultural College, Clemson College -
D. B. Rosenkrans.
Wofford College, C. B. Waller.

SOUTH DAKOTA, South Dakota State College, Brookings - E. A. Walker.
Northville - J. F. Brenckle.

TENNESSEE, Agricultural Experiment Station, Knoxville - C. D. Sher-
bakoff.
University of Tennessee, Knoxville - J. O. Andes,
J. L. Baskin, L. R. Hesler.

- TEXAS, Agricultural Experiment Station, College Station -
 J. J. Taubenhaus, W. N. Ezekiel, S. E. Wolff.
 Sub-Station No. 15, Weslaco - W. J. Bach.
 Temple Sub-Station, Temple - Colonel Hoyt Rogers.
 Prairie View Normal, Prairie View - G. H. Dickerson.
- UTAH, Utah Agricultural College, Logan - B. L. Richards.
- VERMONT, Agricultural Experiment Station, Burlington - B. F. Lutman.
- VIRGINIA, Agricultural Experiment Station, Blacksburg - S. A. Wingard,
 James Godkin, R. G. Henderson, A. B. Massey.
 Virginia Truck Experiment Station, Norfolk - H. T. Cook.
 Field Laboratory, Winchester - A. B. Groves.
 Field Laboratory, Staunton - R. H. Hurt.
 Hampton Institute, Hampton - T. W. Turner.
- WASHINGTON, Agricultural Experiment Station, Pullman - F. D. Heald.
 Longbeach - D. J. Crowley.
 Washington State College, Pullman - L. K. Jones.
 Western Washington Experiment Station, Puyallup -
 G. A. Huber.
- WEST VIRGINIA, West Virginia College of Agriculture, Morgantown -
 C. R. Orton.
 Agricultural Experiment Station, Morgantown - A. Berg,
 E. C. Sherwood.
 Agricultural Experiment Station, Kearneysville -
 F. J. Schneiderhan.
- WISCONSIN, Agricultural Experiment Station, Madison - L. R. Jones.
 University of Wisconsin, Madison - G. W. Keitt, A. J.
 Riker, R. E. Vaughan.
- WYOMING, Agricultural Experiment Station, Laramie - Aven Nelson,
 W. G. Solheim, G. H. Starr.
- HAITI, Port Au Prince - H. D. Barker.
- HAWAII, Pineapple Experiment Station, Honolulu - M. B. Linford,
 C. P. Sideris.
- PUERTO RICO, Insular Experiment Station, Rio Piedras - M. T. Cook,
 J. A. B. Nolla, Arturo Roque-Perez.



TEMPERATURE



Fig. 3. Departure from the normal temperature for the summer, 1934, June to August, inclusive.

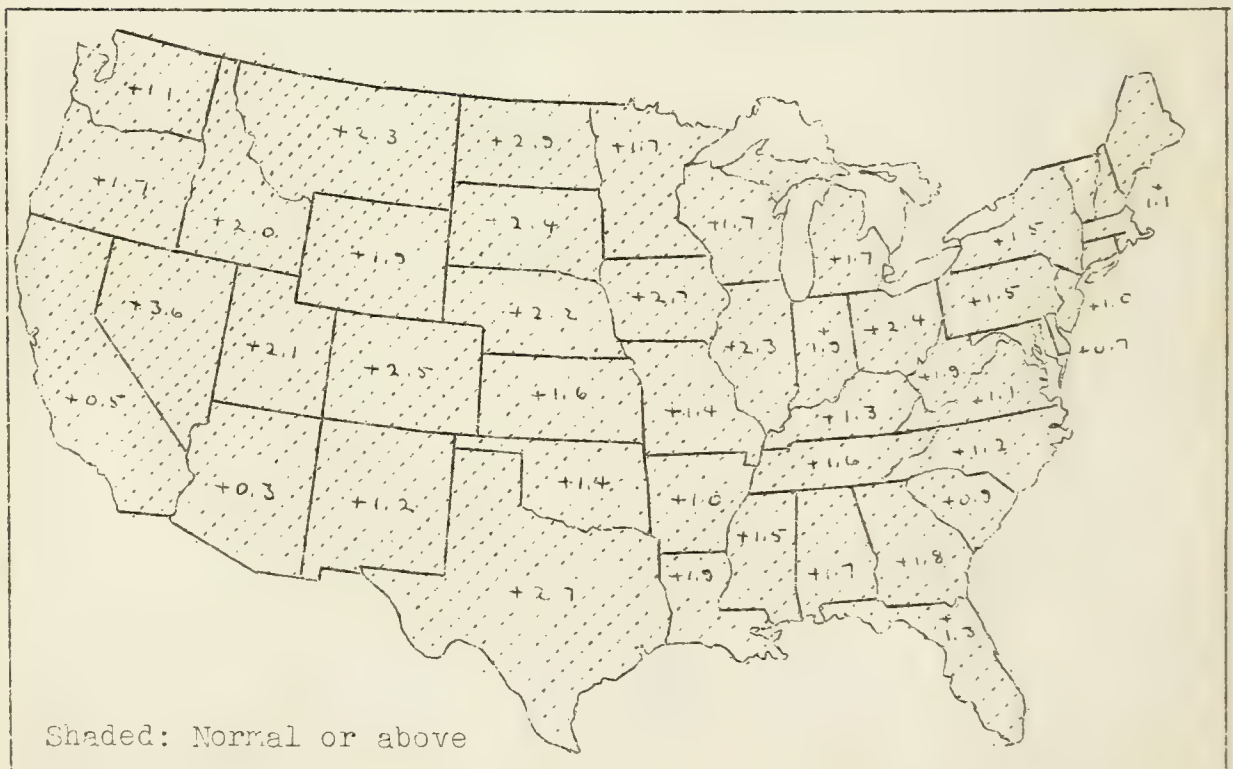


Fig. 4. Departure from the normal temperature for the autumn of 1934, September to November, inclusive.

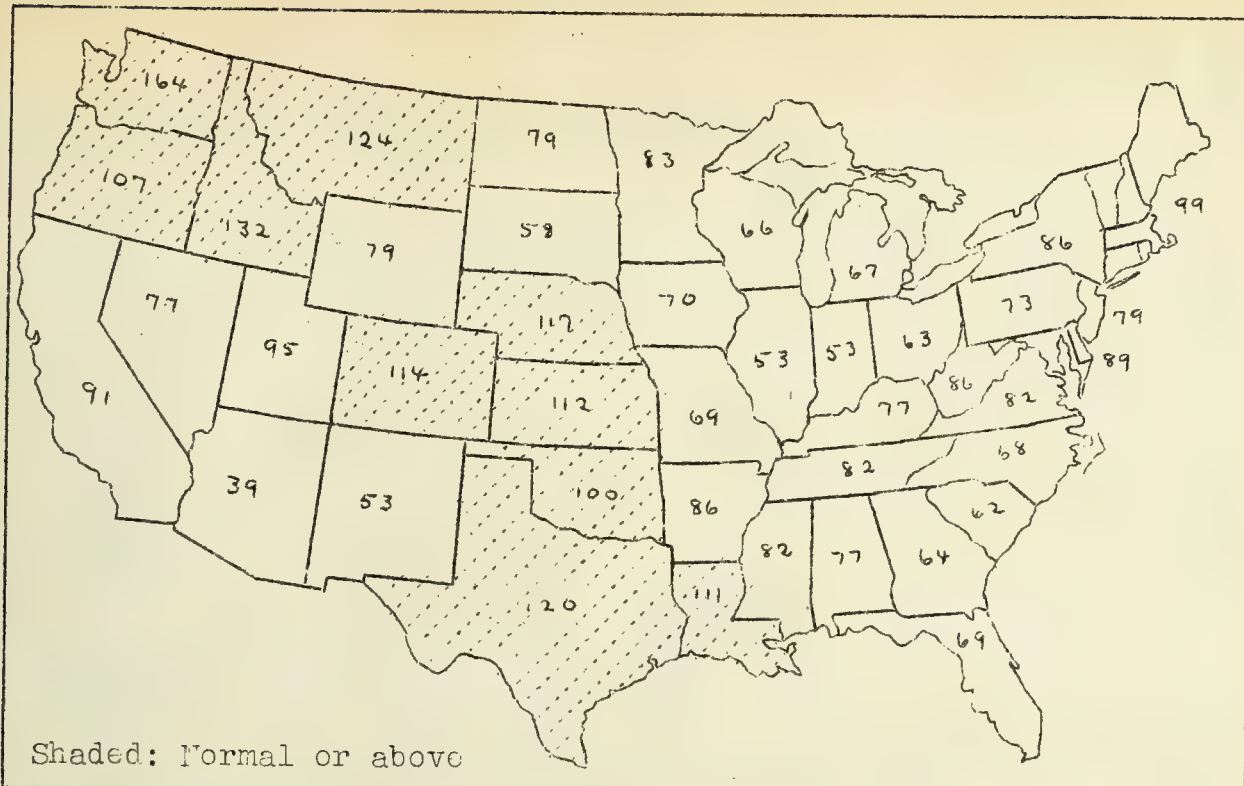


Fig. 5. Percentage of normal precipitation for the winter, December, 1933 to February, 1934, inclusive.

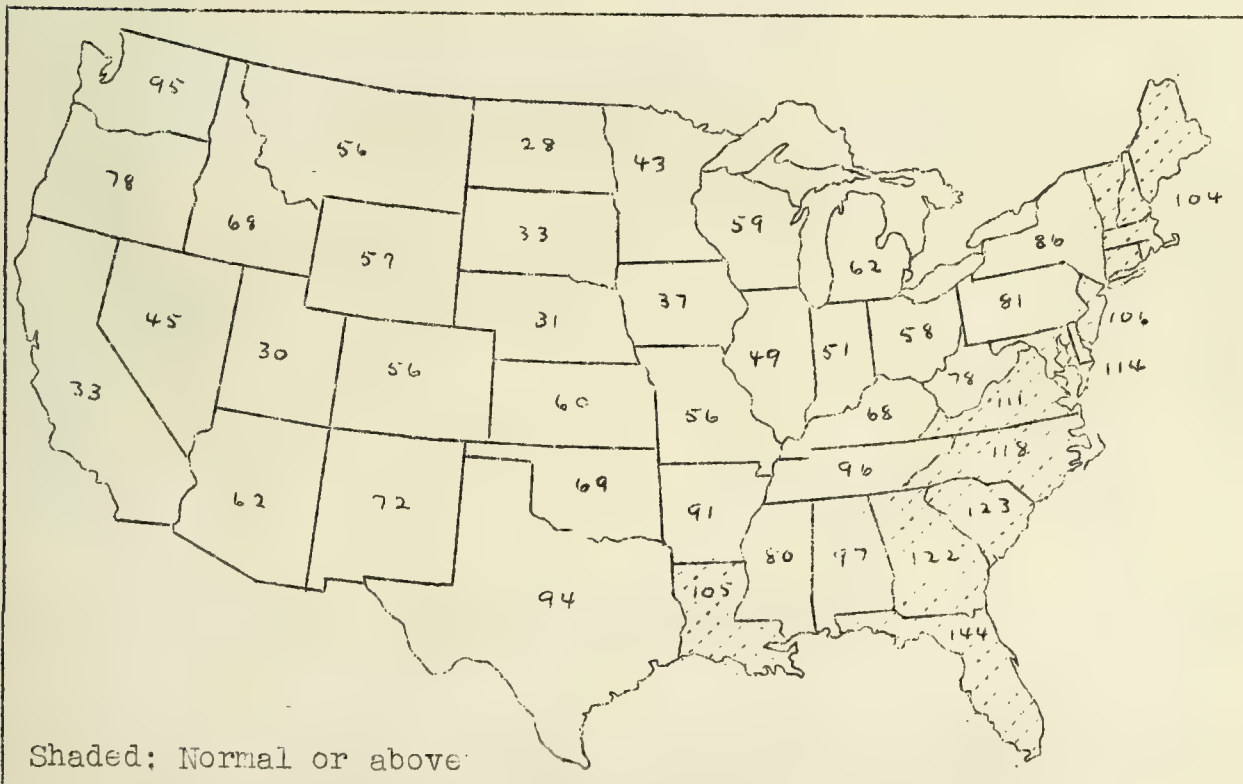


Fig. 6. Percentage of normal precipitation for the spring, March to May, 1934, inclusive.

PRECIPITATION

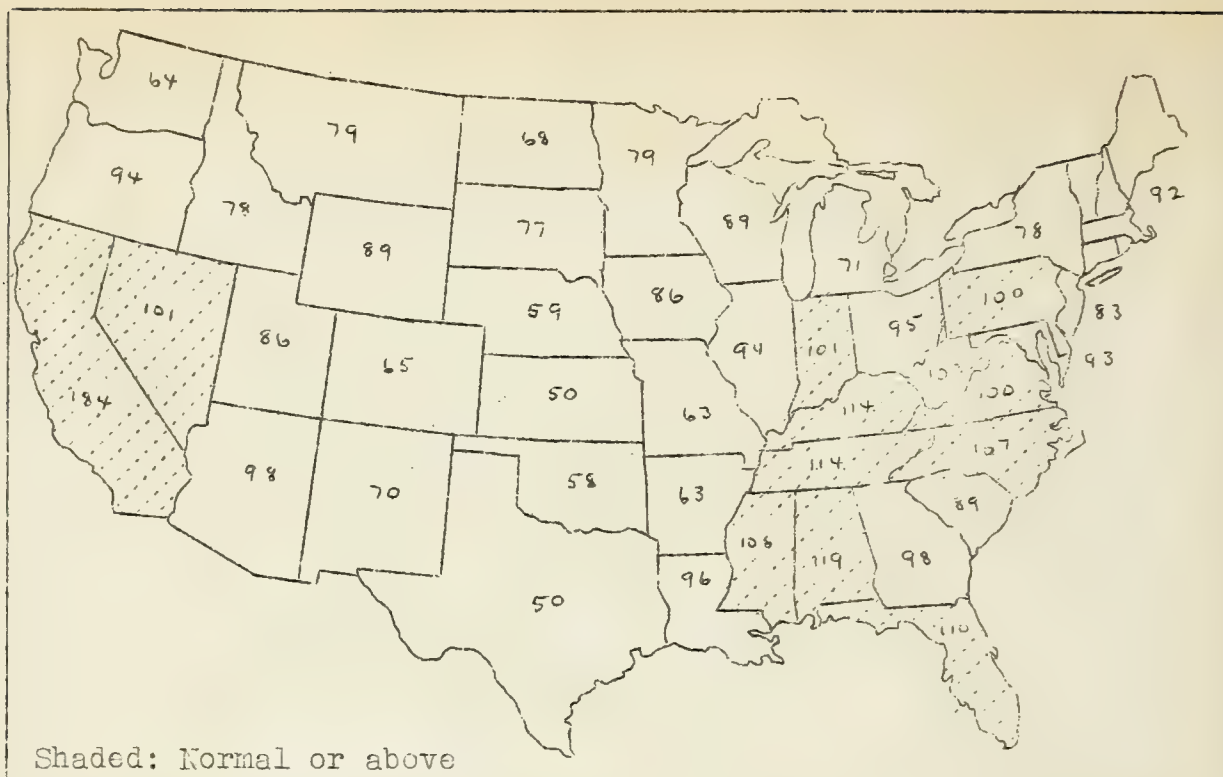


Fig. 7. Percentage of normal precipitation for the summer, June to August, 1934, inclusive.

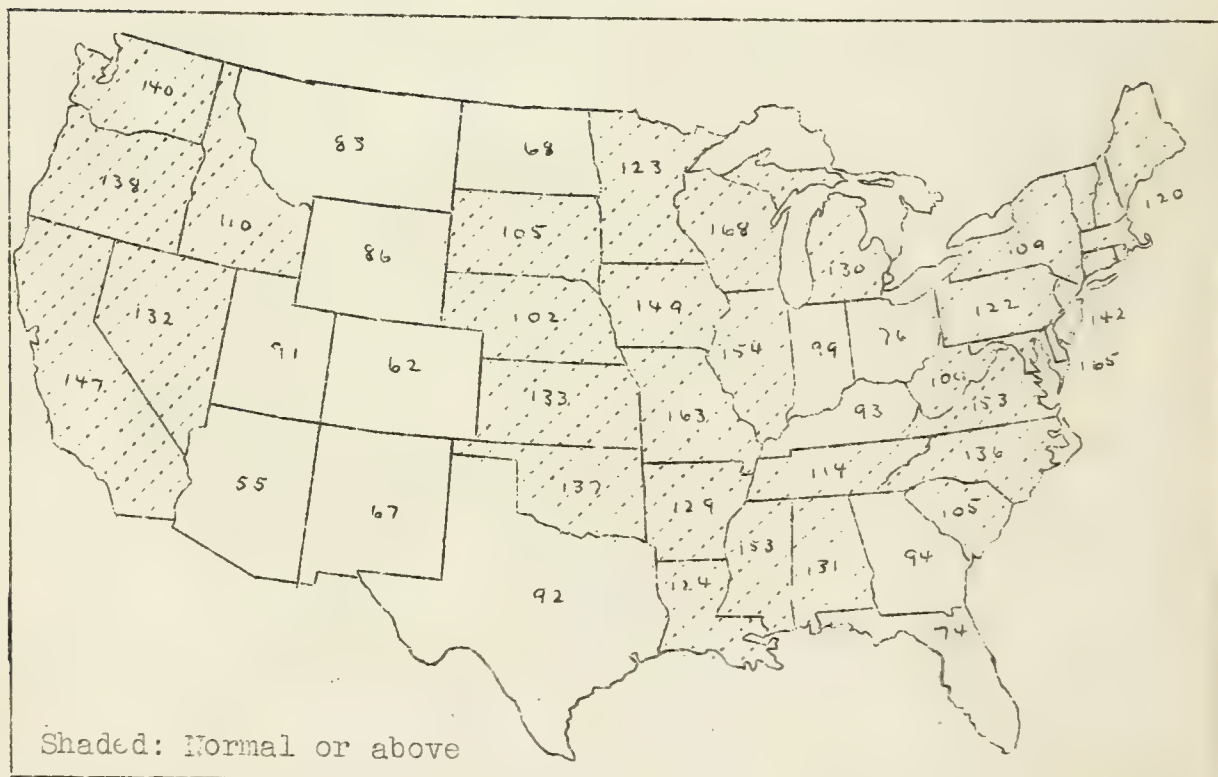


Fig. 8. Percentage of normal precipitation for the autumn, September to November, 1934.

HARRISBURG, PENNSYLVANIA

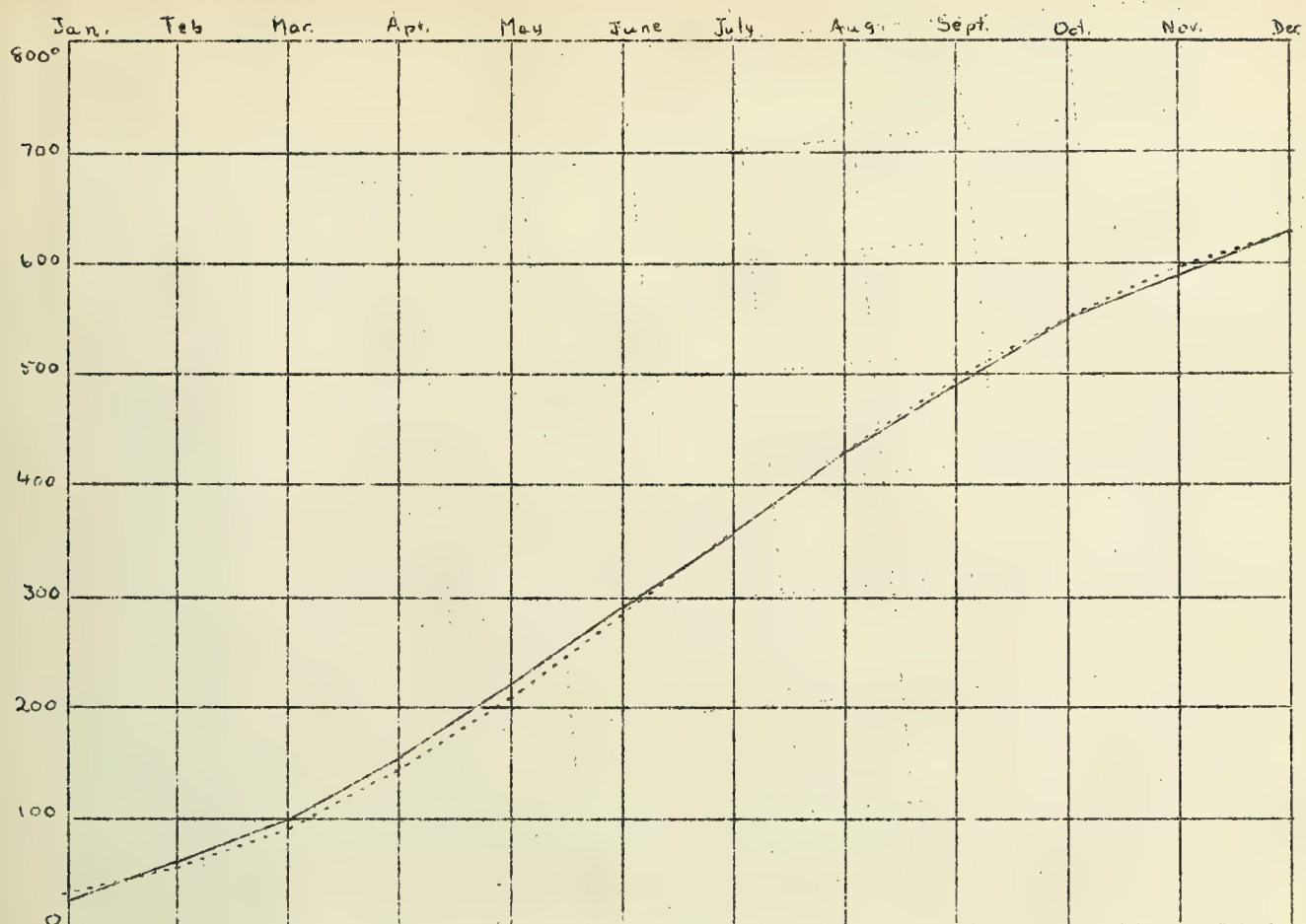


Fig. 9. Accumulated temperature in degrees F. for Harrisburg, Pennsylvania, 1934 (dotted line), compared with normal (solid line).

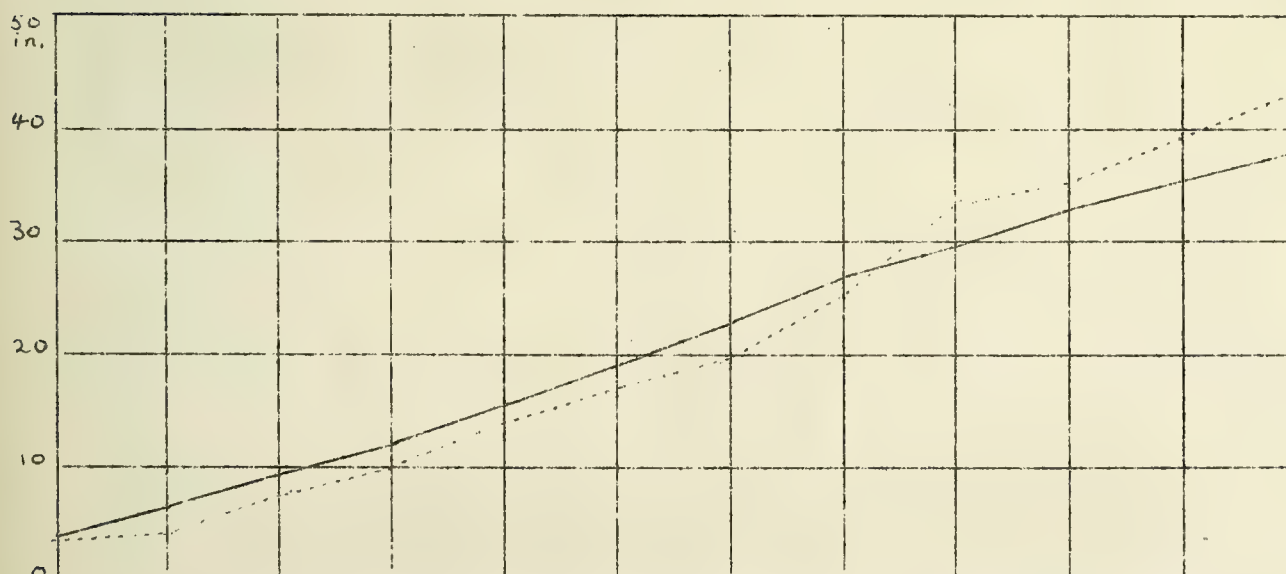


Fig. 10. Accumulated precipitation in inches for Harrisburg, Pennsylvania, 1934 (dotted line), compared with normal (solid line).

ATLANTA, GEORGIA

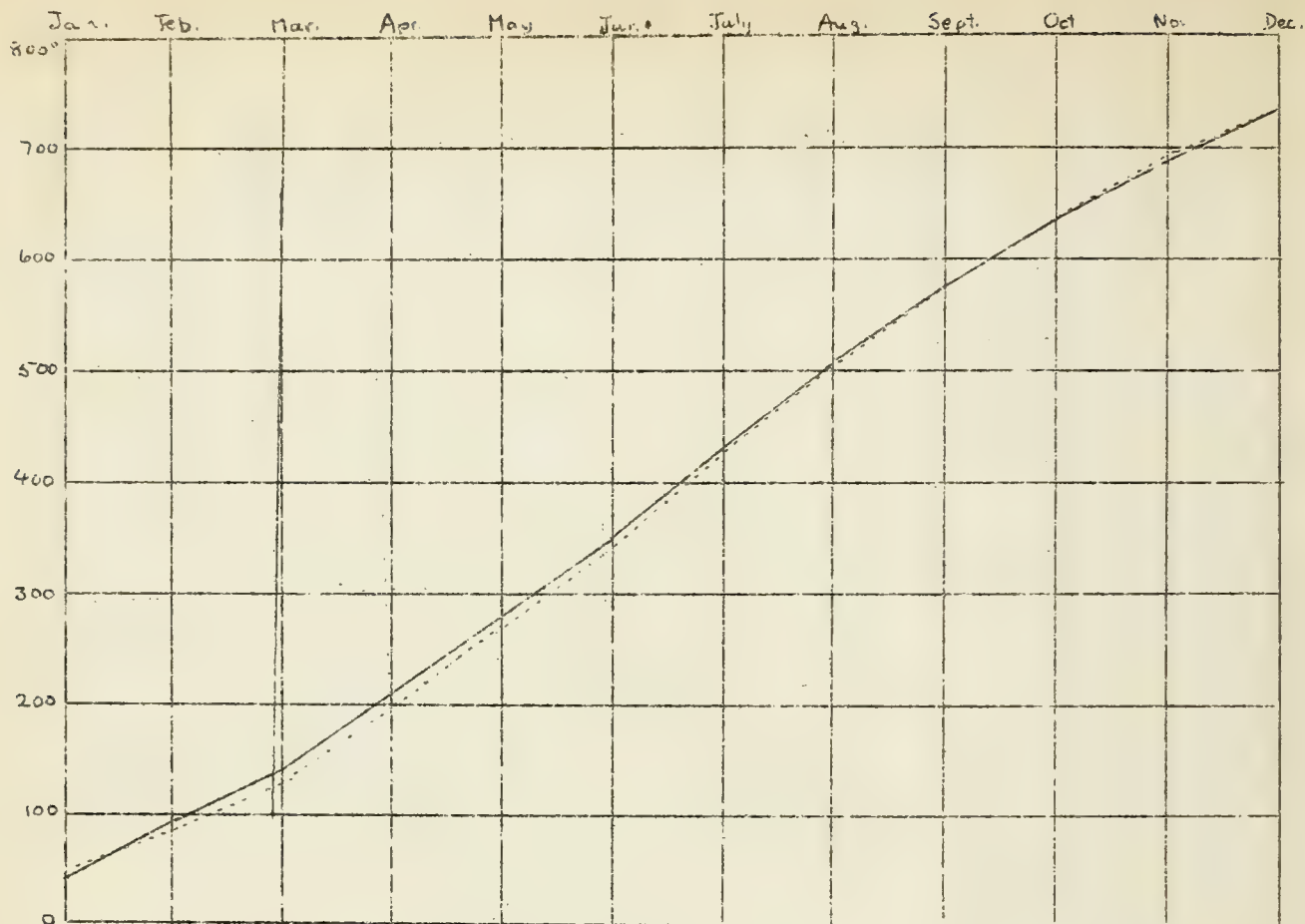


Fig. 11. Accumulated temperature in degrees F. for Atlanta, Georgia, 1934 (dotted line), compared with normal, (solid line).

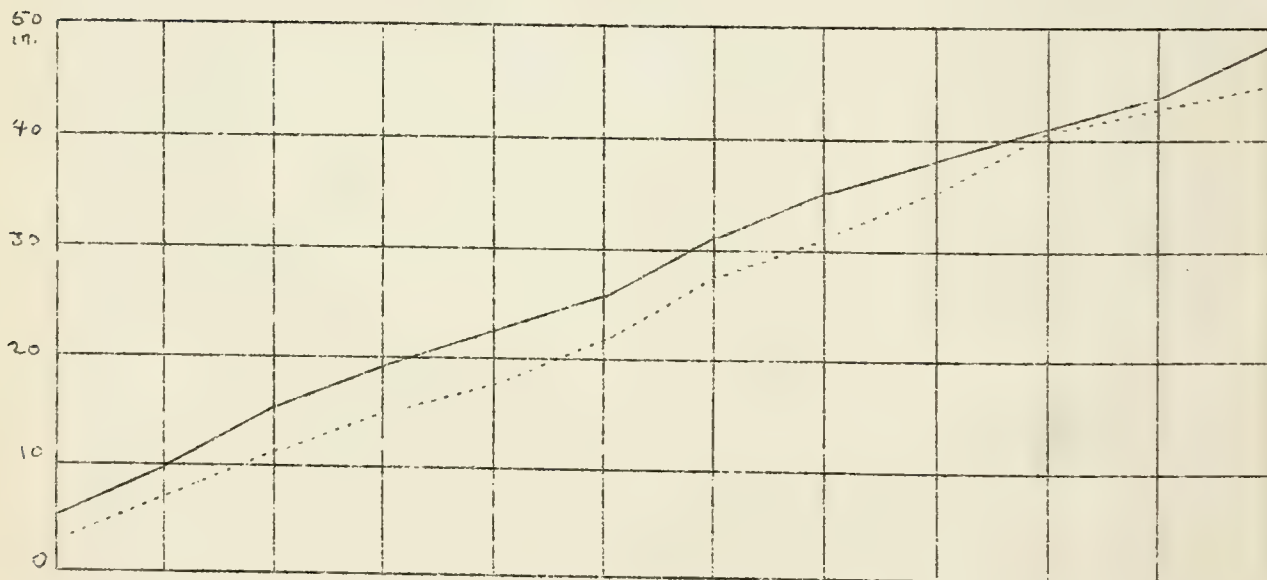


Fig. 12. Accumulated precipitation in inches for Atlanta, Georgia, 1934 (dotted line), compared with normal, (solid line).

BISMARCK, NORTH DAKOTA

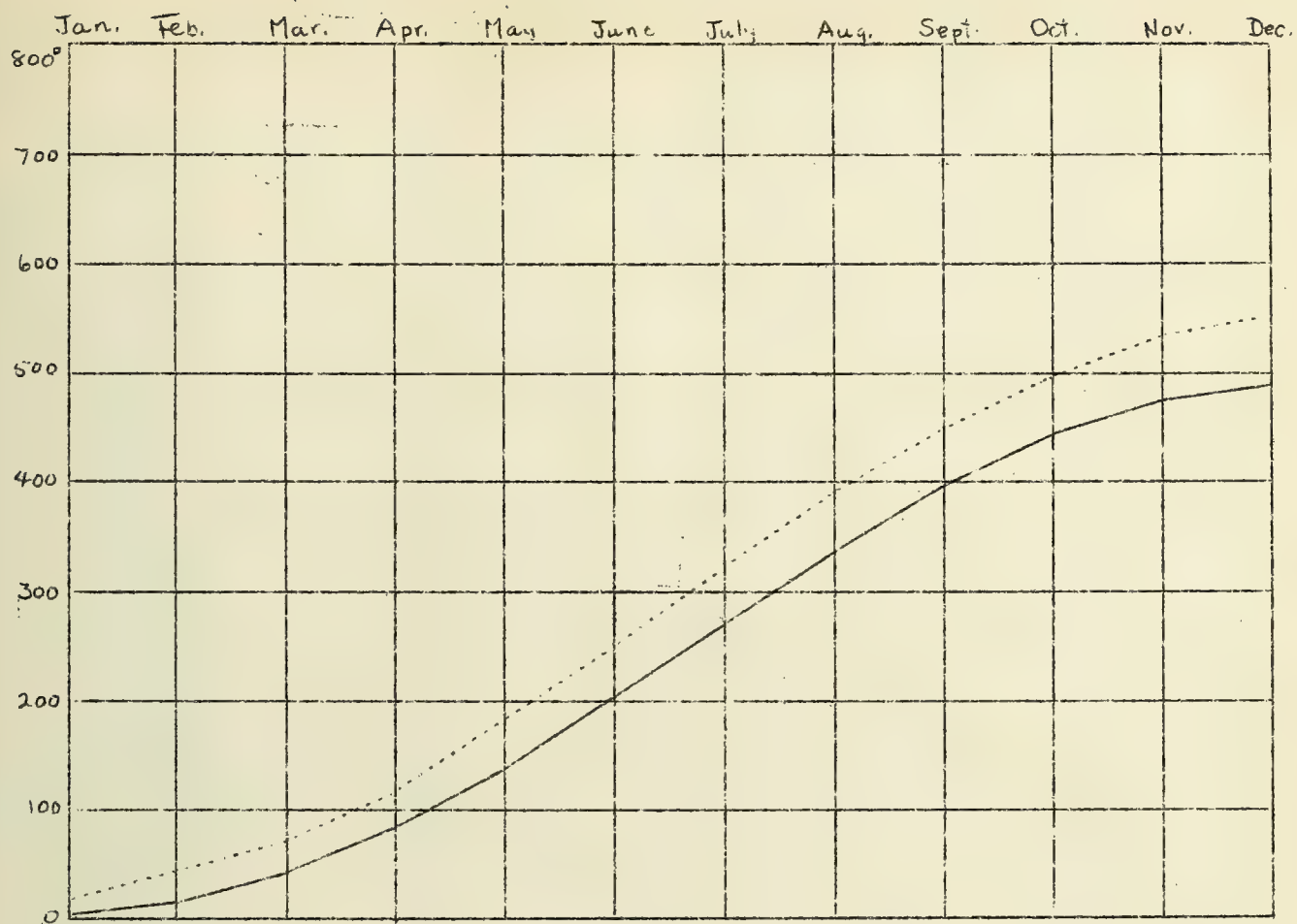


Fig. 13. Accumulated temperature in degrees F. for Bismarck, North Dakota, 1934 (dotted line), compared with normal (solid line).

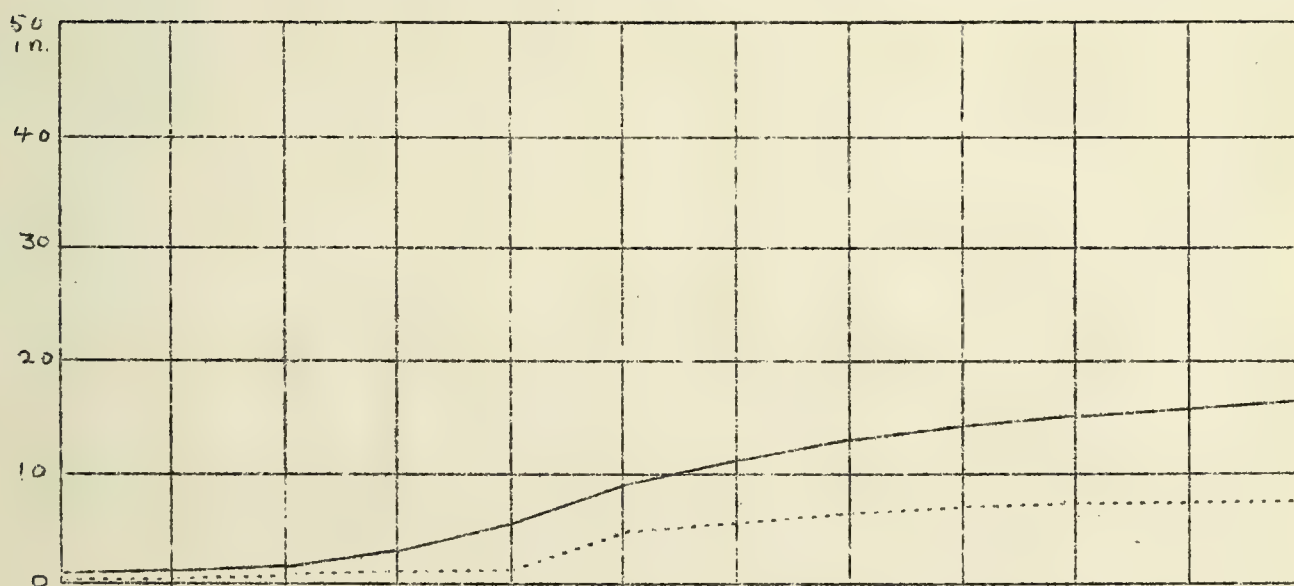


Fig. 14. Accumulated precipitation in inches for Bismarck, North Dakota, 1934 (dotted line), compared with normal (solid line).

LITTLE ROCK, ARKANSAS

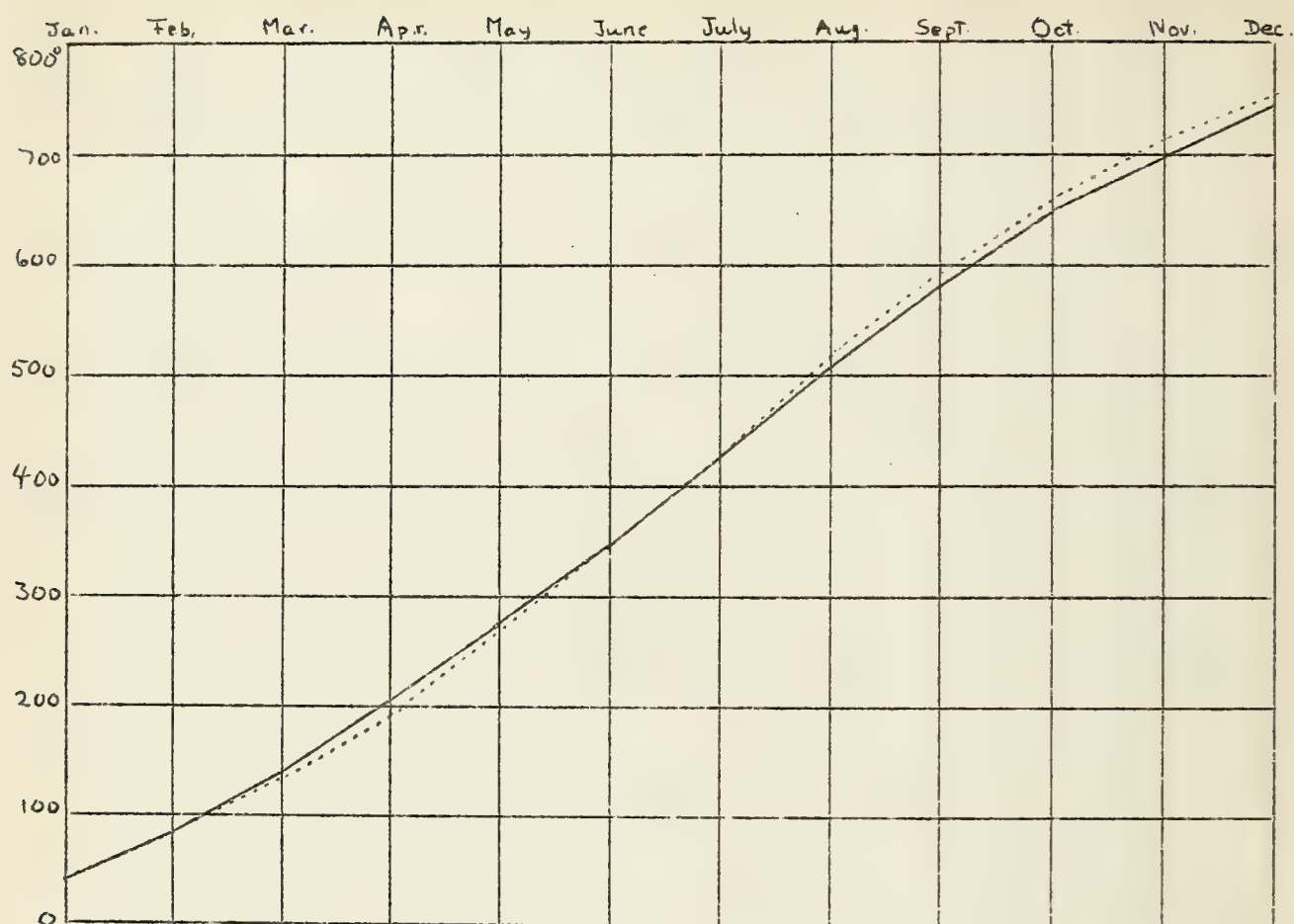


Fig. 15. Accumulated temperature in degrees F. for Little Rock, Arkansas, 1934 (dotted line), compared with normal (solid line).

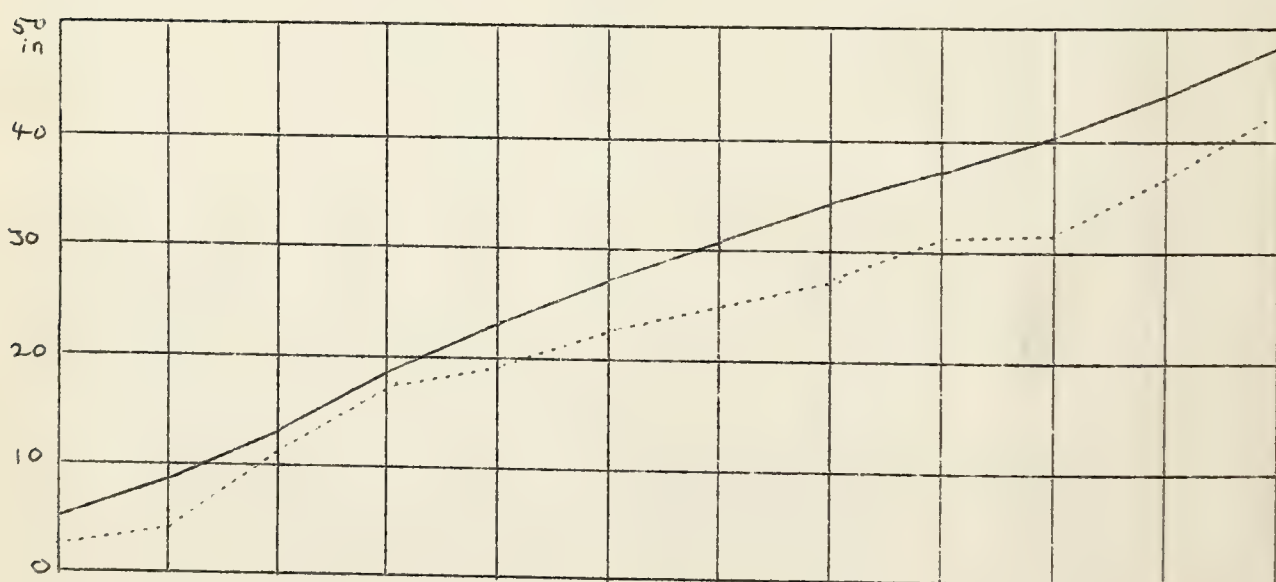


Fig. 16. Accumulated precipitation in inches for Little Rock, Arkansas, 1934 (dotted line), compared with normal (solid line).

PORTLAND, OREGON

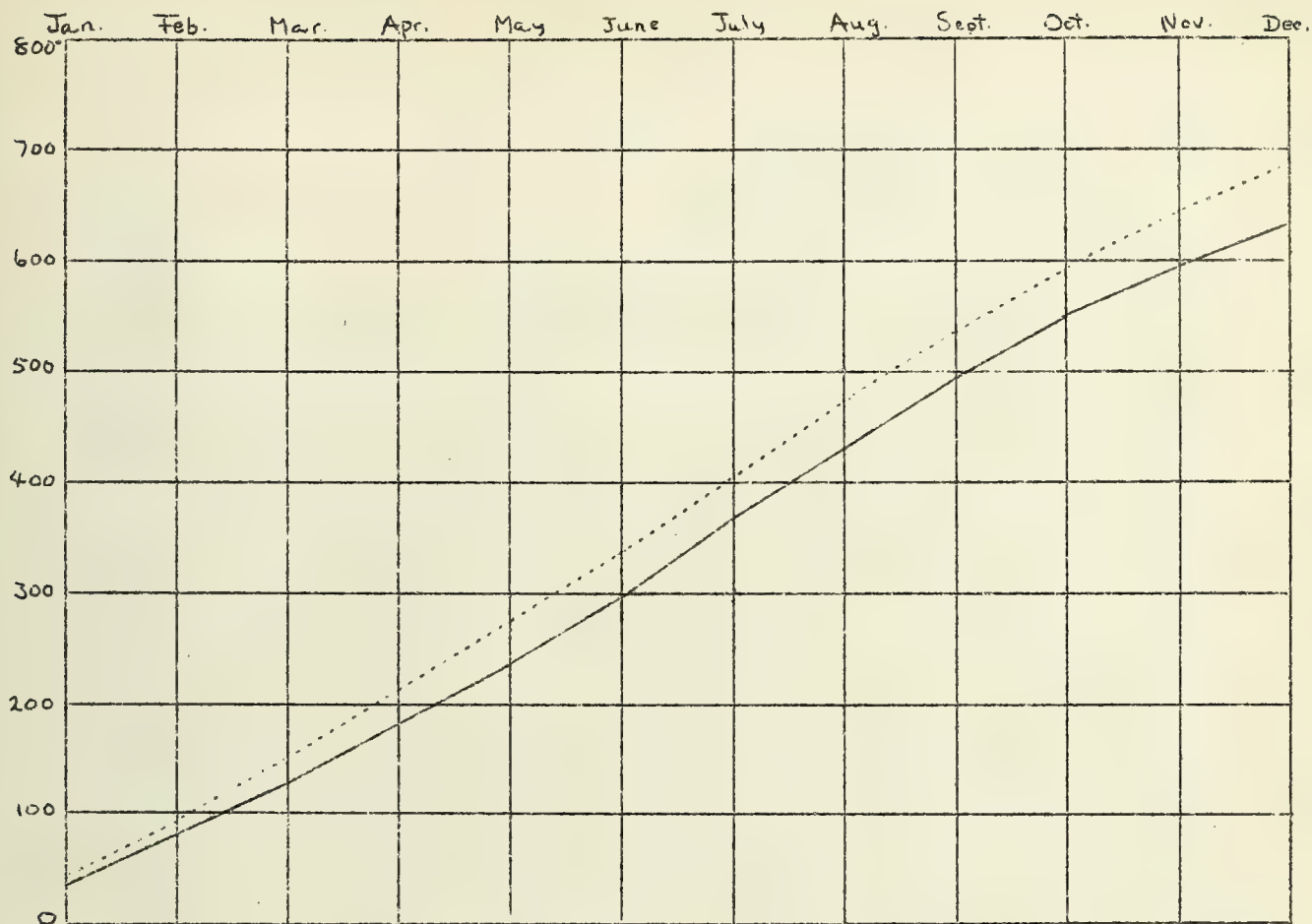


Fig. 17. Accumulated temperature in degrees F. for Portland, Oregon, 1934 (dotted line), compared with normal (solid line).

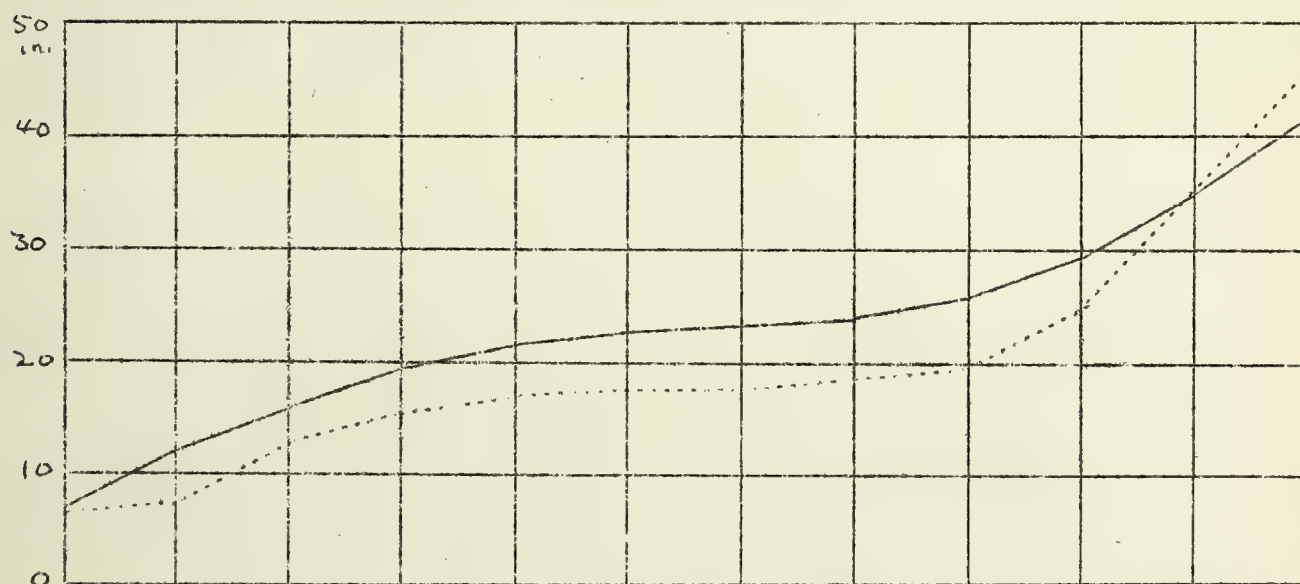


Fig. 18. Accumulated precipitation in inches for Portland, Oregon, 1934 (dotted line), compared with normal (solid line).

SACRAMENTO, CALIFORNIA

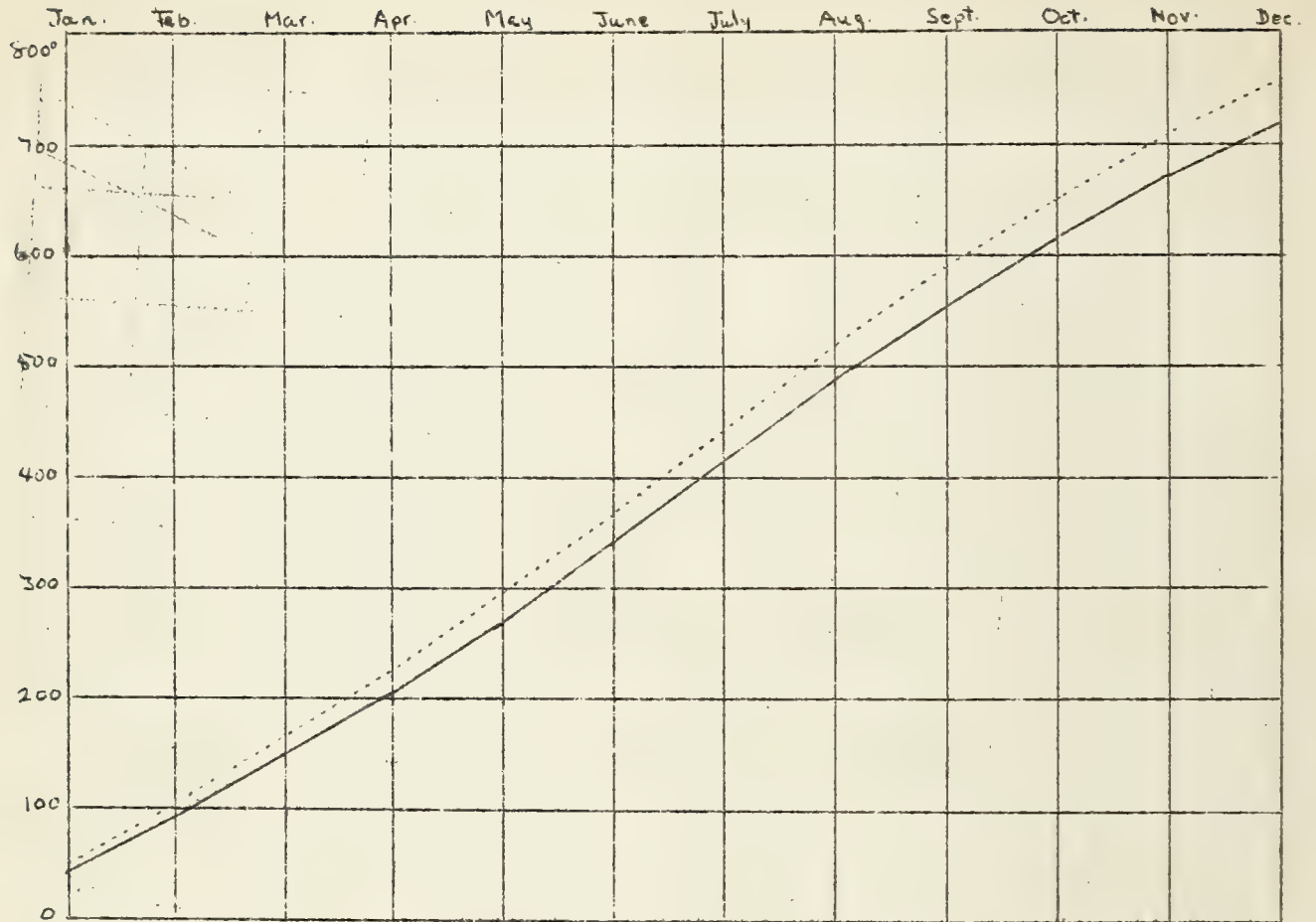


Fig. 19. Accumulated temperature in degrees F. for Sacramento, California, 1934 (dotted line) compared with normal (solid line).

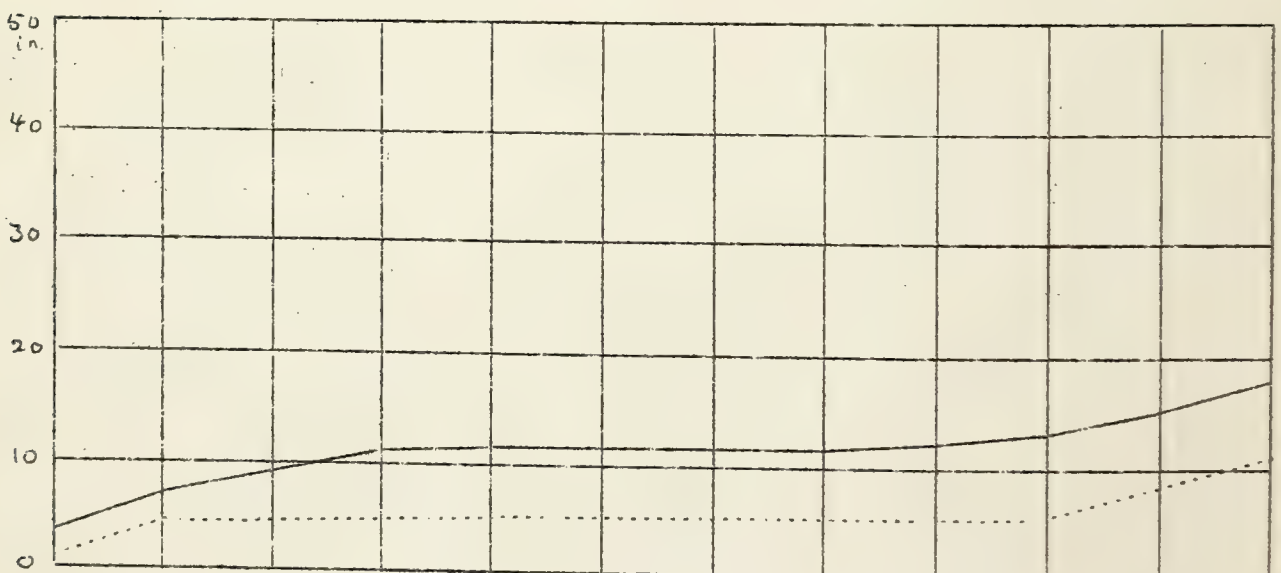


Fig. 20. Accumulated precipitation in inches for Sacramento, California, 1934 (dotted line), compared with normal (solid line).

D I S E A S E S O F C E R E A L C R O P S

W H E A T

BUNT (Tilletia levis and T. tritici) occasioned losses estimated as follows: Maryland, West Virginia, North Carolina, Montana, each 3 per cent; Michigan, 2.5; Oregon, 2; Washington, 1 to 2; Ohio and North Dakota, each 1.5; Pennsylvania, 1.3; Texas, Indiana, and Kansas, each 1; South Carolina and Minnesota, 0.5; Delaware, Wisconsin, and Colorado, each a trace. In Idaho, 5 to 10 per cent loss occurred locally, but there was much less for the State as a whole. T. levis occurred in about the usual amount in Wyoming. An apparently distinct physiologic form of T. tritici, so-called "low smut," was prevalent in the Cache Valley, Utah.

LOOSE SMUT (Ustilago tritici). Losses from loose smut through the country as a whole appear to have been somewhat less severe than in 1933. Lefebvre stated that smut seems to be on the increase in Kansas, and Young in Montana reported "the first serious damage to winter wheat by loose smut, according to my memory of conditions." Muncie, in Michigan, reported the hot, dry weather at flowering time in 1933 unfavorable to development of the disease this season. Losses of more than a trace were recorded as follows: Georgia, 3 per cent; Pennsylvania, 2.4 per cent, West Virginia, 2; Maryland, Michigan, 1.5; New York, North Carolina, South Carolina, Texas, Ohio, Minnesota, each 1; Montana, 0.7, North Dakota, 0.4; Kansas, 0.25. Infection was heavy in north-central Texas with some fields showing an incidence of 35 per cent. At Athens, Georgia, from 5 to 15 per cent developed in experimental plots planted with untreated seed.

FLAG SMUT (Urocystis tritici) was found in a limited number of fields, with a prevalence of less than 1 per cent in each case, in the former quarantine area in Illinois. A trace, with maximum incidence of 5 per cent, was reported locally in Kansas. In the vicinity of Leavenworth, in fields where the disease was found in 1930, its prevalence appeared unchanged. In variety tests on a farm near Leavenworth, Kanred was resistant, and Harvest Queen selection 2418 highly resistant. Local Harvest Queen was listed among the very susceptible varieties.

STEM RUST (Puccinia graminis tritici). Losses from stem rust were very slight throughout most of the country. It was severe in Wythe, Grayson, and Carroll Counties in Virginia where barberries are generally distributed. In central Texas 100 per cent infection

occurred generally although losses for the State were not serious. In Minnesota, considerable rust appeared in some localities on Ceres, usually a very resistant variety. Maine reported the presence of stem rust. Percentage losses reported were 10 in Massachusetts; 5 in Minnesota; 3, South Carolina; 2, North Dakota; 1, Texas; 0.5, Ohio; trace, Pennsylvania, Tennessee, North Carolina, Oklahoma, Michigan, Wisconsin, South Dakota, Nebraska, Kansas, Washington, and Oregon. Illinois, Indiana, Iowa, Montana, Wyoming, Colorado, each reported no loss from stem rust. Maryland and Kentucky reported that the disease was not observed.

LEAF RUST (Puccinia rubigo-vera tritici = P. triticea) appeared early and in severe form in Western Washington where it caused losses of 25 to 35 per cent constituting the most serious outbreak in the history of the region. In Central Texas, infection was extremely heavy especially on the hard red winter wheats. Infection was also extremely heavy on winter wheat in the vicinity of Lawton and Stillwater, Oklahoma, but drought conditions prevented the general epidemic which seemed indicated. F. M. Rolfs, writing in January, stated, "An inspection of the leaf rust situation through sixteen of our northern and western counties during December (1933) shows a general infection throughout the entire area. Infection varied from 5 to 80 per cent. Up to date I have been unable to find a single field free of leaf rust." However, due to drought, only traces of leaf rust could be found in the vicinity of Woodward in May. One hundred per cent infection was noted in experimental plots at Knoxville, Tennessee. Rust appeared late in the season in Georgia and spread rapidly causing considerable damage. Somewhat similar conditions prevailed in South Carolina and to a less extent in North Carolina. Incidence is summarized as follows: Maine and Tennessee, present; South Carolina, 15 per cent loss; Georgia, 12; Massachusetts and Pennsylvania, 10; Oregon, 6.5; West Virginia, North Carolina, Texas, each 5; Illinois, 2; Ohio, 0.5; Maryland, Oklahoma, Michigan, Wisconsin, Minnesota, North Dakota, Kansas, Montana, Colorado, Washington, each a trace.

STRIPE RUST (Puccinia glumarum) was reported present in moderate amounts on winter wheat in Oregon.

SCAB (Gibberella saubinetii) was held in check throughout most of the country by the dry weather. It occurred locally in areas in eastern Maryland and eastern Virginia where there were June rains, causing a 5 per cent reduction in yield and an additional 5 per cent loss in grade. The disease was not observed in Michigan or Kansas. Other States reporting no loss were Minnesota and Iowa. Maine reported its presence; Massachusetts, Tennessee, Texas, Ohio, Wisconsin, North Dakota, each a trace; Pennsylvania, 0.5 per cent with a 10 to 15 bushel reduction in yield in some fields; Delaware and West Virginia, each 1 per cent; North Carolina, 2 per cent.

GLUME BLOTCH (Septoria nodorum) was more severe than usual in Pennsylvania, Virginia, and North Carolina. It was also found doing serious injury to one field of Tennessee Purple Straw in North Georgia but very little was observed in other fields. It was much less prevalent than in 1933 in Maryland.

SPECKLED LEAF BLOTCH (Septoria tritici) was more generally found in Pennsylvania than for several years, with an average incidence in surveyed fields of 9.04 per cent. It was also more prevalent than usual in North Carolina (0.2 per cent); northwestern Oklahoma; and in a few fields in northern Georgia. It was also observed on spelt in Oregon.

BASAL GLUME ROT (Bacterium atrofaciens) was reported only from Kansas where no loss resulted and the disease was much less prevalent than in 1933 or in average years.

BLACK CHAFF (Bacterium translucens undulosum) was reported to be more prevalent than in former years in North Carolina but the loss was only 0.1 per cent. It was not observed in Wisconsin and was much less prevalent in Minnesota than in 1933 or in average years. A trace of injury resulted from scattered infections in North Dakota.

FOOT AND ROOT ROTS (Helminthosporium sativum, Fusarium spp., Cercospora herpotrichoides, Gibellina cerealis). Losses from foot rots were estimated as follows: Massachusetts, Pennsylvania, Illinois, Michigan, Wisconsin, Colorado, Washington, each a trace; Kansas 0.25 per cent; Louisiana, North Dakota, each 0.5; Minnesota, 1; North Carolina, Oregon, 3 each; Montana 4 to 10; Idaho, 10. In the drought area the estimation of loss was difficult because the proportion of injury attributable to the presence of parasites could not be distinguished readily from that caused primarily by lack of moisture. Helminthosporium sativum was mentioned as present in Pennsylvania, Michigan, Wisconsin, Minnesota, North Dakota, and Montana. In Montana, foot rots, chiefly Helminthosporium, killed most of the wheat prematurely, especially in Gallatin and Yellowstone Counties. In one field observed, the wheat on 70 out of 90 acres was rendered worthless. Fusarium was mentioned associated with Helminthosporium as a causal agent in Minnesota, Kansas, and Montana. Cercospora herpotrichoides appeared in Idaho, Oregon, and Washington. Hungerford, Raeder, Pierce, and Bever reported that this root rot made its first appearance in epiphytotic form in Idaho, Lewis, Nezperce, Clearwater, and Latah Counties, Idaho, in the spring and summer of 1934. Approximately 157,000 acres were involved with an estimated loss of 10 per cent. In Kootenai County, where the disease has been known to occur previous to 1934, 6,000 acres were involved with an estimated loss of 10 to 15 per cent. Gibellina cerealis was reported from Oregon on both wheat and spelt as well as on Holcus lanatus.

POWDERY MILDEW (Erysiphe graminis) was reported from Pennsylvania, North Carolina, Indiana, Michigan, Kansas, Montana and Washington. Except in North Carolina, where the disease was more prevalent than usual with an estimated loss of 0.2 per cent, powdery mildew caused only traces of injury or was so held in check as to be of no economic significance.

ERGOT (Claviceps purpurea) was reported as occurring in about the usual amount in Ohio and scatteringly distributed in Wisconsin and North Dakota, where it was less prevalent than in 1933.

TAKE-ALL (Ophiobolus graminis) occurred scatteringly in much less than the usual prevalence in Kansas and in a few fields in Idaho where losses were estimated at 2 to 5 per cent.

ANTHRACNOSE (Colletotrichum graminicolum) was less prevalent than usual in Pennsylvania, causing only a trace of loss.

NEMATODE DISEASE (Anguillulina tritici) was reported locally distributed in North Carolina and Georgia.

PHYSIOLOGICAL DISORDERS. Floret sterility resulting from frost injury was reported from Washington. A peculiar condition of wheat heads somewhat resembling black chaff disease in appearance was reported from several localities in northern Illinois. It has been diagnosed as the result of crossing or mixing of strains.

Various abnormalities in growth of heads and spikelets, blasted tips, non-blooming florets, and other malformed organs, due to lack of moisture and excessive heat were reported from Montana.

R Y E

STEM RUST (Puccinia graminis secalis). Stem rust was less prevalent than usual. Massachusetts reported 4 per cent loss; Texas 1; and Ohio 0.5. Traces or no injury were recorded for Pennsylvania, Michigan, Wisconsin, Minnesota, North Dakota, Colorado, and Washington.

LEAF RUST (Puccinia rubigo-vera secalis = P. dispersa) occasioned loss as follows: Pennsylvania, 6 per cent; Massachusetts, 2; Georgia, Texas, and Ohio, each 1; Oregon, 0.3; Delaware, West Virginia, North Carolina, Michigan, Wisconsin, each a trace; Minnesota and North Dakota, each no loss.

ERGOT (Claviceps purpurea) was estimated to have caused injury of 1 per cent in Massachusetts and Wisconsin; traces in Pennsylvania, West Virginia, Michigan, Minnesota, and Colorado; 0.1 per cent in Ohio, and 0.6 in North Dakota. In this connection, it is of interest to note that 12.2 per cent of the 433 cars of rye received at Minneapolis in August 1934 were classed as ergoty and 21 per cent of the 240 cars inspected in September. Rye is classed as ergoty when it contains ergot in excess of 0.3 per cent.

STEM SMUT (Urocystis occulta). Two per cent smut was reported locally from Anderson County, Tennessee. No State loss greater than 0.1 per cent was reported.

SCAB (Gibberella saubinetii) was reported from Ohio and Wisconsin with losses of 1 per cent and a trace, respectively.

ANTHRACNOSE (Colletotrichum graminicolum) occasioned a trace of reduction in yield locally in Wisconsin.

WINTER INJURY AND DROUGHT resulted in a 60 per cent loss in Massachusetts.

HEAT AND DROUGHT destroyed 15 per cent of the crop in Wisconsin.

B A R L E Y

COVERED SMUT (Ustilago hordei). Twenty States reported the presence of covered smut with estimated percentage losses as follows: Maine, Massachusetts, New Jersey, Delaware, Wisconsin, Iowa, Kansas, and Colorado, each a trace; Pennsylvania, 7.6 for fall sown, and 3.5 for spring sown; Georgia, 6; Maryland, 5; West Virginia and Montana, each 2; Texas, Ohio, and Minnesota, each 1; North Dakota, 0.6; North Carolina and Michigan, 0.5; and Oregon, 0.2. Ohio, Minnesota, North Dakota, and Kansas reported the disease more prevalent than in average years, while Maryland, Michigan, and Iowa reported less than the average amount, and Pennsylvania less than in any year since winter barley became generally grown in the State. The maximum injuries reported from single fields were 23 and 20 per cent from Pennsylvania and Kansas, respectively.

LOOSE SMUT (Ustilago nuda) was reported as general in Pennsylvania, Wisconsin, and Iowa. Other States reporting its occurrence are Massachusetts, Maryland, West Virginia, North Carolina, Texas, Ohio, Michigan, North Dakota, Kansas, Montana, and Colorado. The percentage losses follow: Massachusetts,

Kansas, and Colorado, each a trace; Michigan and North Dakota, each 0.5; Pennsylvania, 4.6 for fall sown, and 2 for spring sown; North Carolina, 5. Loose smut has been on the increase in Pennsylvania since winter barley became generally introduced into the State. Ustilago mediana was reported as generally distributed in Minnesota.

STEM RUST (Puccinia graminis tritici) caused relatively little damage. Maryland, Montana, and Washington reported that the disease was not observed. The losses were light. Massachusetts and Minnesota each reported 2 per cent loss; Ohio and Texas each 0.1; all others only a trace. The rust appeared early but the dry season was inimical to its development and spread.

LEAF RUST (Puccinia anomala) was reported as of general distribution in Pennsylvania and Oklahoma, and scattered in Wisconsin and Minnesota. It also occurred in Maryland, Ohio, and Michigan. Percentage losses reported were: Pennsylvania 2.3; Maryland and Ohio, each 0.5; Michigan, trace; Wisconsin and Minnesota, none. The maximum occurrence in any one field was 10 per cent in Pennsylvania.

STRIPE (Helminthosporium gramineum). The presence of stripe was reported from Massachusetts, Pennsylvania, Maryland, Virginia, North Carolina, South Carolina, Wisconsin, Minnesota, Iowa, North Dakota, and Wyoming. It was more prevalent than last year in Pennsylvania and Virginia, but less prevalent in Minnesota and Iowa where early high soil temperatures were reported as unfavorable for the development of stripe. Distribution of the disease was general in Virginia and North Carolina, scattered in Minnesota and North Dakota, and local in northern Iowa. Seed treatment gave effective control in Pennsylvania and North Carolina. Losses were light, varying from a trace in Massachusetts, South Carolina, and Iowa, to 9.1 per cent for untreated fields in Pennsylvania. Maximum infections of 20 and 15 per cent were reported from Pennsylvania and Minnesota, respectively.

SPOT BLOTCH (Helminthosporium sativum). Spot blotch was reported from Pennsylvania, North Carolina, Texas, Michigan, Wisconsin, Minnesota, Iowa, North Dakota, Montana, and Oregon. It was more prevalent than in 1933 in Pennsylvania and Iowa. It was found in each of 64 surveyed fields in Pennsylvania with an average infection of 11.1 per cent and a maximum infection of 20 per cent. Losses for the State were estimated at 1 and 2 per cent, respectively, for spring and winter barley. In Iowa, loss in yield was put at 1 per cent with additional loss in grade of 0.5 per cent. It is also found in germinators on samples of seed submitted for

analysis and is regarded as an important cause of seedling blight in Iowa. The loss in North Carolina was estimated as 1 per cent. Texas, Michigan, Wisconsin, Minnesota, and North Dakota each reported only a trace of infection. None was observed in Massachusetts.

NET BLOTCH (Pyrenophora teres) was reported as less prevalent than in 1933, causing only traces of injury in Pennsylvania, Michigan, Wisconsin, Minnesota, North Dakota, Montana, and Oregon.

SCAB (Gibberella saubinetii). Scab was reported from New Jersey, Pennsylvania, Maryland, North Carolina, Texas, Ohio, Michigan, Wisconsin, Minnesota and Iowa. It was severe in some fields in New Jersey and much more prevalent than in 1933 or in the average year in Maryland where the reduction in yield was estimated as 3 per cent. The loss in North Carolina was placed at 2 per cent. Prevalence in the other States reporting was less than usual with loss of a trace only except in Ohio and Wisconsin where it was estimated to be 2 and 1.8 per cent, respectively.

ERGOT (Claviceps purpurea) was strikingly less prevalent than in 1933. Ohio reported about the usual amount with a total loss in yield and grade of 1 per cent. Wisconsin, Minnesota, and North Dakota each listed only traces. The disease was found in Michigan only as a scattered infection on volunteer barley after harvest.

POWDERY MILDEW (Erysiphe graminis) was reported from New Jersey, Pennsylvania, Maryland, Georgia, and Wisconsin. It was common but not serious, except in a few fields, in New Jersey, slightly more prevalent than in 1933 in Pennsylvania with an average infection of 17.1 per cent and a maximum infection of 60 per cent in the 64 fields surveyed. General and heavy infection of winter barley in North Georgia developed in May. Normal prevalence with loss amounting to a trace was reported from Maryland, and less infection than usual from Wisconsin.

SCALD (Rhynchosporium secalis) was reported only from Wisconsin where it occurred locally and in less amount than in 1933, due, it is believed, to the inhibitory effect of the drought.

BACTERIAL BLIGHT (Bacterium translucens). A heavy epiphytotic of bacterial blight was reported as occurring in the vicinity of Waseca, Minnesota. Seventy varieties of barley on the Experiment Station at Waseca were heavily infected on leaves, awns, and seed.

SEEDLING BLIGHTS (Various Fungi imperfecti). Minnesota reported seedling blights, ordinarily very important, much less prevalent than in average years. The restricted and scattered

occurrence was attributed to the dry season.

ROOT ROT (Fusarium spp. and Helminthosporium spp.) was reported as present in considerable amount in Minnesota, as in average years, but associated with drought in such a way as to render difficult the estimation of the amount of injury attributable to each.

O A T S

SMUT (Ustilago avenae and U. levis). As in 1933, losses from smut were again relatively heavy in 1934. The estimates follow: Maine, present; Massachusetts, 15 per cent; New Jersey, 8.9; Maryland, West Virginia, North Carolina, Georgia, Wisconsin, Montana, each 5; Texas 3; Arkansas, Ohio, Michigan, Minnesota, and Kansas, each 2; North Dakota, 0.5; Oregon, 0.4; Pennsylvania, Colorado, and Washington, each a trace. Smut was prevalent in New York and Wyoming. In a variety test in Cayuga County, New York, covering 65 acres in 13 localities, the average incidence on Swedish Select was 5.26 per cent and on Cornellian a trace. The maximum infection reported in any one field was 21 per cent. Loose smut continued to be prevalent in Texas, Oklahoma, and Kansas; mostly in the form that attacks Fulghum, according to C. O. Johnston. Following the introduction of the Fulghum type of oats, loose smut increased and rapidly moved northward until it is now coextensive with the distribution of Fulghum. Occasional fields sown with untreated seed had as much as 25 per cent smut. Smut is much more prevalent in northern than in southern Arkansas. Practically perfect control was secured in that State through the use of Ceresan dust and the formaldehyde spray method. In Iowa, in a test with twenty farmers each planting treated and untreated seed, the loss caused by smut was 8 per cent. Late-planted oats in Iowa had less smut because of early high soil temperatures.

STEM RUST (Puccinia graminis avenae). Rust appeared early and abundantly in the Pacific Northwest and in Louisiana and Texas. In Oregon, in common with other cereal rusts, it was held in check by an active attack of Darluca filum but considerable rust occurred on early seeded winter oats. In volunteer oats, stem rust was very destructive. In central Texas, 100 per cent infection was prevalent on both rust-proof and non-rust-proof varieties, but good stands of oats compensated for rust loss. The dry weather checked the spread and development of the disease northward. In Minnesota it was much more prevalent than in 1933 or in average years but in most of the country it was less prevalent or much less prevalent than usual. Losses were estimated as follows: Minnesota, 5 per cent; Texas, 4; Massachusetts, 2; North Carolina,

South Carolina, North Dakota, and Oregon, each 1; Ohio, 0.5; Pennsylvania, Maryland, Arkansas, Michigan, Wisconsin, South Dakota, Nebraska, and Washington, each a trace; Illinois, Indiana, Kansas, Montana, Wyoming, and Colorado, each no loss.

Stem rust was also reported from Maine, New Jersey, where it was generally distributed, Louisiana and Oklahoma.

CROWN RUST (Puccinia coronata) was reported as severe in Louisiana, central Texas, and Oregon. In experimental plots of winter oats in Louisiana the heavy infection killed some varieties by heading time. The Victoria, Bond, Alber, and Berger varieties showed promising resistance in Louisiana and Texas. Rust was relatively light in North Texas but the loss for the State was estimated at 20 per cent. In Oregon where crown rust and Fusarium root rot together practically destroyed the crop in the Coast country, the crown rust loss for the State was set at 35 per cent. South Carolina and Arkansas each estimated losses of 5 per cent; West Virginia, 2; Georgia, trace to 1 per cent, and North Carolina, 0.2 to 1 per cent; New Jersey, Ohio, 0.5; Wisconsin, 0.1; Massachusetts, Delaware, Maryland, Iowa and North Dakota, each a trace; Minnesota, Kansas, and Montana, each 0.

FOOT ROT (Gibellina cerealis). The fungus designated tentatively as Gibellina cerealis Pass. appeared in the coastal region of Oregon in January, 1934, four months earlier than it had been seen in any of the three previous years during which it has been under observation there.

FOOT ROT (Fusarium spp.) was reported from Michigan and Oregon. In Michigan this disease was less prevalent than in 1933 or in average years, causing only a trace of loss. In the Coast country of Oregon, as previously recorded, foot rot and crown rust virtually destroyed the crop. The loss for the State from foot rot is estimated at 10 per cent.

SCAB (Gibberella saubinetii) was observed in Maryland, Wisconsin, and Ohio. Losses were negligible.

HALO BLIGHT (Bacterium coronafaciens) was observed in New York and Minnesota. Swedish Select in New York showed high resistance even when grown near infected Cornellian. In Minnesota, the disease was generally distributed but less prevalent than usual, causing no loss.

POWDERY MILDEW (Erysiphe graminis) was observed in the Puget Sound area in Washington, and in New Jersey.

LEAF SPOT (Helminthosporium avenae) caused a trace of injury in Michigan. Maximum infection of 15 per cent was observed.

BLAST (cause undetermined) was observed in North Dakota in about the same prevalence as in 1933. The loss was estimated at 0.5 per cent.

RED BLADE (Nutritional disturbance) was reported from Washington.

STERILE HEADS (Frost injury). Frost injury caused an appreciable number of partly sterile heads in Washington.

C O R N

SMUT (Ustilago zeae). Of the twenty-nine States reporting the incidence of corn smut, four reported it as more prevalent than in 1933 and seven (three in addition to the four) as more prevalent than in average years. One, Maryland, reported less than last year and one, Kansas, much less because so much of the corn crop was completely killed by the drought and heat. Twelve States reported the incidence of smut the same as last year which was higher than in normal seasons. Thirteen varieties in experimental plots in Georgia had an average of 25 per cent of ear infection. Tennessee and Indiana reported maximum incidence of 25 and 20 per cent, respectively, in some fields. Percentage losses were estimated as follows: 7 in Iowa; 5 Pennsylvania and Georgia; 4, Michigan, Minnesota; 3, West Virginia, Ohio, Wisconsin; 2, Massachusetts, North Dakota; 1, North Carolina, Texas, Arkansas, Indiana, Kansas, Colorado; 0.5, South Carolina, Florida; trace, Delaware, Maryland, Montana, Washington. Connecticut reported the disease as "bad on certain varieties"; New Jersey, "generally distributed and severe in some instances," Tennessee and Wyoming, "generally distributed"; Louisiana, "severe in the southwestern part of the State." Mississippi reported the usual incidence.

HEAD SMUT (Sorosporium reilianum) was reported from Oregon as the cause of 0.4 per cent loss; and occurred in Washington also.

RUST (Puccinia sorghi) was unimportant, as usual. The greatest losses estimated were 2 per cent in Georgia and 1.5 per cent in Florida. Other losses did not exceed 0.5 per cent.

ROOT ROTS (Various organisms) were reported from Massachusetts, 2 per cent; Pennsylvania, trace; Delaware, 1; Maryland (Gibberella saubinetii) 10; West Virginia, 2; North Carolina, 3; South Carolina, 5; Florida, 0.5; Texas, 0.1; Ohio, 0.5; Indiana, trace; Michigan, 0.5;

Wisconsin, 1; Minnesota, trace; Kansas, 1; Montana, same; Oregon, 0.1. In South Carolina root rots and potash deficiency seem to be closely related and estimates of loss from root rots alone are difficult since applications of potash seem greatly to reduce such losses. Seedling blight and root rots were reported as follows: Ohio (Gibberella, Fusarium, Diplodia, etc.), trace; Indiana (Penicillium spp.), 1 per cent, (Gibberella saubinetii), trace. In Indiana, Pythium spp. caused only isolated cases of seedling blight but appeared late in the season as the cause of root rot with a maximum infection of 100 per cent in some fields but resulting in only a trace of loss. Rains following the drought period that had lasted through pollination were conducive to heavy cortical root rotting by this organism.

STALK ROTS (various organisms other than Diplodia). Losses due to stalk rots were reported as follows: Massachusetts, trace; New Jersey (Fusarium spp.), less than usual; Pennsylvania, 5 per cent; West Virginia, 1; North Carolina, 1; Georgia, 3; Florida, 3; Texas, 1; Wisconsin, 9.9; North Dakota (Fusarium spp.) 1; Kansas, trace. Root and stalk rots in combination were reported from New Jersey (Fusarium spp.) and Florida (Gibberella saubinetii) with loss a trace. Stalk and ear rots due to Basisporium gallarum and Fusarium moniliforme were reported more prevalent than usual in Wisconsin causing an estimated loss of 2 per cent.

EAR ROTS (various organisms other than Diplodia) were reported from Massachusetts, trace; Pennsylvania, 10 per cent; Maryland, 5; West Virginia, 3; North Carolina, 3; Georgia, 3; Florida, 7; Texas, 0.5; Indiana (Aspergillus), trace, (Fusarium), 1.5, (Penicillium), 1.5; Michigan (Fusarium) 0.2; Wisconsin, 1; North Dakota, 5; Kansas, trace. Dry weather gave rise to poor husk covering of ears in Indiana and the high temperatures at pollination time caused poor filling providing moisture pockets and dead silks for growth of rot producing organisms, which were further aided by corn ear worm injury. In the south-central and southern parts of the State some infection was present on almost every ear. Maximum infections were reported for individual fields in the State as follows: Fusarium spp., 100 per cent; Aspergillus, 80, Penicillium, 80. Fusarium was also reported as prevalent in the Coastal Plain and Piedmont of North Carolina causing an estimated loss of 20 per cent.

Gibberella saubinetii was reported as the cause of ear rot locally in Mississippi and of a trace of loss in Indiana where only two or three cases of ear rot due to this organism were found during the entire harvest season. Diplodia zae was reported to occur causing losses as follows: Massachusetts, 1 per cent; Pennsylvania, trace; West Virginia, 1; Kentucky, 4 to 18, with

average of 8 in variety and strain cross tests at Lexington; Florida, 7; Louisiana, Texas, 1; Ohio, 2; Indiana, 4.5; Michigan, 0.3; Wisconsin, 1; Iowa, 9; Montana, trace. Diplodia zeae and various other organisms were reported together as causing ear rots as follows: Maryland (with Fusarium), 5; Georgia (with Fusarium moniliforme) in Rabun County, 5; Ohio (with Fusarium, Gibberella, etc.), 0.5. In Florida, root, stalk, and ear rots were reported as follows: Diplodia frumenti, 1.5 per cent; Diplodia macrospora, 2.5; Diplodia zeae, 3; Gibberella moniliformis, 5. Ear and stalk rots due to Diplodia and other organisms were reported from South Carolina and Minnesota causing 5 per cent loss in each State. Phoma zeicola was reported as the cause of ear rot in Texas.

BASISPORIUM DRY ROT (Basisporium gallarum) was generally distributed in Iowa causing a loss of 3 per cent. It occurred locally in Indiana causing a reduction in yield of a trace and a total loss of 1 per cent with a maximum infection of 65. Its presence in Wisconsin in association with stalk and ear rot has been recorded above.

BLACK BUNDLE (Cephalosporium acremonium) caused a trace of loss in Indiana with a maximum incidence of 50 per cent. Drought during the pollination period coupled with intense heat caused a high percentage of barrenness. The disease entered and developed in such stalks during wet weather in the ripening period.

BROWN SPOT (Physoderma zeae-maydis) was reported from North Carolina causing loss of 0.2; northeast Georgia, 5; Florida, 4; Mississippi, scattered occurrence; Louisiana, usual slight amount.

BACTERIAL STALK ROT (Bacterium dissolvens) occurred in scattered localities in Mississippi, and in the extreme southern section of Indiana where it had not been observed previously.

BACTERIAL WILT (Aplanobacter stewartii). Incidence of bacterial wilt on field corn was reported as follows: Georgia, 10 per cent locally on young plants near Cleveland in May; Indiana, trace; Kansas, local. It was also reported on popcorn in Indiana but was less prevalent than in 1933.

LEAF BLIGHT (Bacterial) was generally distributed in Indiana but was less prevalent than in 1933. The maximum incidence was estimated at 90 per cent but the total loss was only a trace.

LEAF SPOT (Helminthosporium turcicum) caused an estimated loss of 1 per cent in Florida.

MOSAIC (Virus) occurred generally scattered over southwestern Louisiana. The amount of injury is undetermined.

DROUGHT INJURY. Physiological disorders associated with or emphasized by the lack of moisture and the high temperatures were important factors in the low yields of corn. Marked reductions in yield were reported from Arkansas and Indiana. Pollination failures were reported of general occurrence in Indiana causing total loss of some fields and an average reduction in yield for the State estimated at 5 per cent with loss in grade of another 5 per cent. Disturbed nutrition associated with excess or unbalanced nitrate supply caused loss estimated at 10 per cent of the crop, with maximum injury of 90 per cent. Nutritional deficiencies due to unbalanced or inadequate supplies of potash or phosphate were believed to cause additional losses of 5 per cent with some fields a total loss. Moisture deficiency was estimated to have caused a loss of 35 per cent with injury as high as 85 per cent in some fields. In the East, Massachusetts reported 10 per cent loss due to drought. Other States affected made no reports.

Acid soil conditions were reported as the cause of poor germination in New Jersey. Smelter fumes injured fields in Washington State.

S W E E T C O R N

SMUT (Ustilago zeae) was reported from Maine, Massachusetts, New York, Pennsylvania, Maryland, West Virginia, Texas, Ohio, Michigan, Wisconsin, Minnesota, North Dakota, Montana, and Colorado. In Massachusetts it is considered the most damaging disease of the crop, year in and year out. In 1934, it caused more damage than all other diseases combined. The moderately wet spring followed by relatively dry summer weather appeared to be most favorable for smut injury. The disease spread rapidly and extensively during the dry weather requiring only the wind to disseminate the spores, and dews to effect new infections. In New York, smut was more prevalent than usual. Losses as high as 25 per cent of ears occurred in several fields. Losses were estimated at 5 per cent in Massachusetts, New York, Pennsylvania, Wisconsin, and Minnesota. Maryland, Texas, and Michigan each reported 1 per cent as did Ohio where there was less infection than in average years. North Dakota reported 2 per cent loss and Montana a trace.

RUST (Puccinia sorghi) was general and severe in the late summer or fall in Nassau and Suffolk Counties, New York. Infection was 100 per cent but the loss amounted to only a trace. Rust was reported as more prevalent than usual in Maine.

ROOT, STALK, AND EAR ROTS (Various organisms)

ROOT ROTS caused an estimated loss of 8 per cent in Maryland.

STALK AND EAR ROT (*Diplodia* and other organisms) was reported to occur as follows: Maine and Michigan, each a trace; Massachusetts and Texas, each 2 per cent; Pennsylvania, 5; Maryland, Wisconsin, and Minnesota, each 1; and West Virginia, 3.

BACTERIAL WILT (*Aplanobacter stewarti*) was very much less prevalent than in 1933 in all the States reporting its presence except in Maryland, Pennsylvania, Virginia, and Texas. The usual amount was reported from Virginia and more than last year from Maryland where the drought was reported to emphasize the symptoms. Only a trace with no loss was reported from Maine and none was found in a survey of New Hampshire sections where the disease was destructive in 1933. A similar report of non-appearance was received from southwestern Ontario. The recession in distribution and severity was attributed in the northeastern sections to the cold winter, and in Indiana and Michigan to the dry spring which appeared unfavorable for the spread of the disease. In Michigan, there was practically no infection on early varieties until ready for harvest as green corn. Mid-July rains brought heavy infections, even to Golden Cross Bantam and Purdue 1339, frequently mentioned as more resistant than common varieties. Percentage losses were reported as follows: Maine, Massachusetts, Connecticut, New York, Wisconsin, and Kansas, each a trace; Texas, Ohio, and Michigan, each 3; West Virginia and Indiana, each 5; Pennsylvania, 20. Other States reporting occurrence are Kentucky and Iowa.

S O R G H U M

HEAD SMUT (*Sorosporium reilianum*) occurred in scattered localities in Wisconsin.

COVERED KERNEL SMUT (*Sphacelotheca sorghi*) was reported from Wisconsin, and Kansas.

SMUT (not specified) was also reported from New Jersey and Arkansas.

CROWN ROT AND ROOT ROT (*Pythium* spp.) was more prevalent than usual locally around Garden City, Kansas, infection amounting to 100 per cent in some fields.

ANTHRACNOSE (*Colletotrichum lineola*) was reported locally severe on cane sorghum in Sevier County, Tennessee, and on broom corn in Mississippi.

F L A X

WILT (Fusarium lini) was reported prevalent in Wisconsin and North Dakota to about the same extent as in 1933.

RUST (Melampsora lini) was observed in Wisconsin, North Dakota, but was less prevalent than in average years. The dry season was unfavorable to the development of the disease. According to P. A. Young, rust was not seen on the wild flax, Linum lewisii, in the Bridges Mountains in Montana, in either of the dry seasons 1933 or 1934, although previously abundant in the vicinity of the College "M" on Mount Baldy.

PASMO (Phlyctaena linicola) occurred scatteringly in Wisconsin.

HEAT CANKER (Non-parasitic) occurred generally on flax in North Dakota. The reduction in yield was estimated at 1 per cent.

R I C E

STEM ROT (Leptosphaeria salvinii) was less prevalent than last year in Arkansas.

LEAF SPOT (Helminthosporium oryzae) was generally distributed in Arkansas with about the usual prevalence.

SMUT (Tilletia horrida). Arkansas reported that smut was not observed.

BLAST (Piricularia grisea) was reported from Louisiana.

STRAIGHTHEAD (Non-parasitic). Reported in Arkansas.

D I S E A S E S O F F O R A G E A N D C O V E R C R O P SA L F A L F A

BACTERIAL WILT (Aplanobacter insidiosum). A loss of 5 per cent was reported from Massachusetts where wilt was generally distributed and apparently aggravated by the drought conditions in July and August. It was noted with scattered distribution in Wisconsin, Kansas, and Colorado in less than the usual prevalence. In California, Weimer reported it from three localities in the southern part of the State where it was not previously known. He states that the direction of spread into this new territory suggests that the high winds characteristic of this region at times

may be an important factor in the distribution of this disease. In Wyoming the disease was general in irrigated fields of Grimm and common alfalfa, the only varieties grown commercially, and caused a loss of 15 to 25 per cent.

STEM ROT (Sclerotinia trifoliorum) was reported from Idaho and Washington. Hungerford, Raeder, Pierce, and Bever wrote, "During the early growing season of this year following a very unusual open winter, ranchers in various localities in northern Idaho complained of their alfalfa stands thinning out. Decrease in stand was in most cases accompanied by wilting and death of some of the plants. Isolations made from such plants resulted in securing Sclerotinia trifoliorum Eriks. in a majority of cases.

"The stem and root rot of legumes is a fairly common disease in the northern section of the State, particularly in cut-over land. Only once before in the last 15 years, however, has this disease caused appreciable loss. In 1928, the disease was prevalent on various clovers and alfalfa. Many fields of clover in Bonner and Kootenai Counties were plowed up due to the killing of the plants by this root rot organism. Evidently, this disease can be expected to be more prevalent and to do serious damage following mild winters."

BLACK STEM (Phoma medicaginis) was locally present in northern Colorado and was first definitely identified this season in Idaho from specimens secured from several points in the northern part of the State. It was found at three widely separated sections, namely, Shoshone, Kootenai, and Latah Counties.

VIOLET ROOT-ROT (Rhizoctonia crocorum) was observed in Kansas.

DAMPING OFF (Pythium spp.) was present to about the usual extent in Louisiana. A marked decrease in stand of fall-sown alfalfa was reported from scattered localities in Kansas with infections of as high as 20 per cent. Damping off due to undetermined causes was so severe locally in southern California during the spring that replanting was necessary.

DOWNY MILDEW (Peronospora trifoliorum) was reported from New Jersey, Louisiana, and California.

LEAF SPOT (Pseudopeziza medicaginis) was reported generally distributed in New Jersey, Michigan, and Wisconsin and scatterintly present in Kansas and North Dakota. It occurred also in Connecticut, Wyoming, Colorado, and California. It caused less than the usual amount of damage. No more than a trace of injury was reported.

YELLOW BLOTCH (Pyrenopeziza medicaginis) was more prevalent than usual and generally distributed in Kansas. It also was reported from Washington.

LEAF SPOT (Cercospora medicaginis) was present in Georgia.

RUST (Uromyces medicaginis) was reported as common but not serious in New Jersey; prevalent from August first on in the Athens, Georgia, area, where it caused up to 70 per cent defoliation; and somewhat more severe than usual in southern California where it was the only leaf trouble of much importance.

CROWN WART (Urophlyctis alfalfae) was found in very limited amounts at Riverside, California.

RING SPOT (Virus). Only traces of this disease were seen in Montana in 1934. It was not found at all in a field where it was abundant during the three preceding years.

MOSAIC (Virus) was reported from California where it was less conspicuous than usual.

WITCHES BROOM (Virus?) was observed in Washington.

DWARF (cause unknown) was observed in California. Weimer reported that the disease appears to be quite uniform in the amount of damage it causes from year to year.

YELLOW (due to the potato leaf hopper, Empoasca fabae) was generally distributed and more prevalent than in 1933 or in average years in Wisconsin.

VIRESCENCE. This teratological condition was reported from Washington.

WHITE SPOT (non-par) was reported prevalent in several fields in Middlesex County, New Jersey.

ALBINISM (Physiological). Young reported much less of this trouble than in 1933 or in average years in Montana. It was not noticed in fields in Park County where it had been common for the preceding 8 years. The suggestion is offered that the weak albino plants were unable to survive the drought.

WINTER INJURY (non-parasitic). Reported as generally distributed and much more prevalent than in 1933 in Wisconsin where the hot, dry summer accentuated the injury. In North Dakota, as in 1933, winter injury was more prevalent than in average years. The extremely dry soil favored the injury which caused a loss estimated at 10 per cent.

C L O V E R

POWDERY MILDEW (Erysiphe polygoni) was reported from Massachusetts, Connecticut, New Jersey, Pennsylvania, Georgia, Wisconsin, Kansas, and Washington. It was very prevalent throughout New Jersey and very serious on Trifolium pratense in north Georgia, preventing its growth, and also occurred on T. dubium and T. reflexum but not on T. incarnatum. The damage elsewhere was apparently slight, particularly in the sections where dry, hot weather prevailed.

ANTHRACNOSE (Colletotrichum trifolii) was observed in New Jersey on Italian Red Clover at the College Farm; prevalent in about the usual extent in Tennessee, and in less than average quantity in scattered localities in Wisconsin.

STEM ROT (Sclerotinia trifoliorum) was reported from Washington.

RUST (Uromyces spp.). Uromyces trifolii fallens was reported from Connecticut on Trifolium pratense and from New Jersey; U. trifolii hybridii on T. hybridum from Massachusetts, Connecticut, and Washington; U. trifolii trifolii-repentis from Massachusetts; and U. minor on T. eriocephalum from Washington.

SOOTY SPOT (Phyllachora trifolii) present but not severe in New Jersey.

LEAF SPOT (Septoria trifoliorum) present but not severe in New Jersey.

LEAF SPOT (Cercospora spp.) New Jersey.

NEMATODE (Anguillulina dipsaci) occurred in experimental plantings, Long Island, New York, on Trifolium arvense and T. repens.

MOSAIC (Virus) was of common occurrence in New Jersey and was reported as causing 1 to 2 per cent loss in Tennessee.

HOPPER INJURY (Leaf hoppers) was serious in some fields in New Jersey.

S W E E T C L O V E R

STEM SPOT (Mycosphaerella lethalis)? A stem spot submitted from Pennsylvania was tentatively but not definitely attributed to Mycosphaerella lethalis.

MOSAIC (Virus) Washington.

RING SPOT (Virus) was reported as common on many varieties of white sweet clover and on ordinary biennial yellow sweet clover in Montana.

LEAF SPOT (Ascochyta meliloti) was reported on Melilotus indica from Louisiana.

C O W P E A

WILT (Fusarium vasinfectum tracheiphilum) occurred in small amounts in Clarke, Oconee, and Oglethorpe Counties, Georgia and was generally distributed in about the usual prevalence in Mississippi.

DRY ROOT ROT (Fusarium martii phaseoli) occurred in scattered localities in Georgia.

ROOT KNOT (Heterodera marioni) was reported from scattered localities with about the usual prevalence in Mississippi.

POWDERY MILDEW (Erysiphe polygoni) caused 10 to 15 per cent defoliation in July and August in three counties in North Georgia.

LEAF SPOT (Cercospora spp.) was present but not serious in New Jersey.

POD BLIGHT (Bacterium phaseoli). Locally prevalent in about the usual amount in Mississippi.

SCAB (Cladosporium vigneae). North Carolina.

GRAY MOLD (Botrytis spp.). New Jersey.

MOSAIC (Virus) was general in New Jersey.

HOPPER INJURY (Leaf hoppers). Local in New Jersey.

A U S T R I A N W I N T E R P E A

LEAF AND POD SPOT (Ascochyta pisi) appeared late in Georgia, but by June 8 pycnidia were common on pods and leaves.

LEAF BLOTCH (Septoria pisi) developed in considerable amounts in Georgia. It was first noted about May 1.

MYCOSPHAERELLA BLIGHT (Mycosphaerella pinodes) appeared about May 1, in Georgia. It was especially severe in fields previously planted to peas.

FOOT ROT AND BLIGHT (Ascochyta pinodella) developed in Georgia about May 24.

BACTERIAL BLIGHT (Bacterium pisi). This disease appeared in Georgia in April destroying the lower leaves on infected plants and killing some vines outright. The average loss was estimated at 10 per cent.

POWDERY MILDEW (Erysiphe polygoni) first appeared in northern Georgia about June 1. It is reported as always serious in southern Georgia.

S O Y B E A N

BACTERIAL PUSTULE (Bacterium phaseoli sojense) was generally distributed and more prevalent than in 1933 in North Carolina where it caused an estimated 2 per cent loss with a maximum incidence of 80 per cent. In the vicinity of Athens, Georgia, losses amounted to 10 per cent. Due to the dry season, it was less prevalent than in former seasons in Arkansas, where it is regarded as the most serious disease of soybeans, causing premature shedding of the leaves.

BACTERIAL BLIGHT (Bacterium sojae) caused the usual trace of loss in North Carolina.

FROGEYE (Cercospora diazu) was general in North Carolina and severe on some varieties. Loss was estimated at 1 per cent. In Arkansas, late maturing varieties were most severely attacked.

POD BLIGHT (Diaporthe sojae). Almost no pod blight was seen in New York as each grower was careful to procure healthy seed. Mid-September rains gave favorable conditions for the development of rather heavy infection in northern Illinois as well as scattered outbreaks in the central part of the State, but subsequently clear weather checked the spread of the disease.

STEM ROT (Sclerotium rolfsii) occurred in local areas in North Carolina causing an estimated loss of 1 per cent.

CHARCOAL ROT (Rhizoctonia bataticola) was reported from California, with the comment that there appears to be varietal resistance among soybeans.

MOSAIC (Virus) was reported from New Jersey but not of great importance, and from Arkansas where it is gradually spreading.

NEMATODE (Anguillulina dipsaci). In experimental plantings on Long Island, New York, soybean proved susceptible and was recorded as a new host for this nematode.

PHYSIOLOGICAL DISORDERS due to lime deficiency and to unbalanced or deficient soil chemicals were reported from New Jersey.

C R O T A L A R I A

STEM CANKER (Diaporthe crotalariae) is severe on Crotalaria spectabilis in Florida. In 1934 it appeared with about the same prevalence as in 1933 and more severely than in average years. A maximum infection of 60 per cent was observed in fields of this important cover crop.

MOSAIC (Virus) was reported on Crotalaria sp. in Puerto Rico, but was less prevalent than usual, probably because the growers have adopted the practice of roguing out volunteer plants.

L E S P E D E Z A

RUST (Uromyces lespedezae-procumbentis) was very serious on native species in late season in Clarke County, Georgia.

V E T C H

LEAF SPOT (Ascochyta pisi) occurred in New Jersey and Mississippi.

G R A S S E S

Some diseases of grasses in Oregon and Washington are listed in the Reporter 18: 24-25, 1934.

SMUTS: Tilletia sp. was reported on Agropyron cristatum, crested wheat grass, from Washington.

Tilletia anthoxanthi was collected on sweet vernalgrass, Anthoxanthum odoratum, in Lycoming and Bradford Counties, Pennsylvania, by G. L. Zundel, who states that these are the fifth and sixth North American collections of the fungus.

Tilletia decipiens was reported on seaside bent, Agrostis palustris (A. maritima) from Oregon.

Ustilago hypodytes was reported from New York and on quincy grass or Indian rice grass, Oryzopsis hymenoides, from Washington.

Ustilago rabenhorstiana. One hundred per cent infection developed on crabgrass, Digitaria sanguinalis, in several fields near Athens, Georgia.

Ustilago striaeformis was reported from Massachusetts.

RUSTS: Puccinia glumarum occurred on Agropyron cristatum in Washington.

Puccinia graminis was reported on redtop, Agrostis alba, from Connecticut and New Jersey. It was very serious in some plantings of timothy, Phleum pratense, in New Jersey, and was reported on timothy from Montana also.

Puccinia purpurea was severe in isolated patches of Johnson grass, Sorghum halepense (*Holcus halepensis*), near Athens, Georgia, in August and September.

ERGOT: Claviceps paspali was common on Paspalum spp. in Clarke County, Georgia.

BLAST: Piricularia grisea was very severe on crabgrass in Middlesex County, New Jersey, and was common on other grasses.

LEAFSPOT: Phyllachora vulgata was reported on Muhlenbergia schreberi from Georgia. Septoria sp., New Jersey. Helminthosporium sp., Massachusetts, New Jersey, and on crabgrass from Mississippi. H. vagans was serious locally in New Jersey on bluegrass, Poa pratensis.

BLIGHT due to Helminthosporium gramineum killed patches in lawns in Georgia.

BROWN PATCH: Helminthosporium vagans was very common throughout New Jersey, and Rhizoctonia sp. occurred in several golf courses. Brown patch was also reported from Massachusetts.

SNOW MOLD: Sclerotium rhizodes was reported from Connecticut. Fusarium nivale was very severe in some plantings in New Jersey.

DAMPING OFF: Pythium sp. caused damping-off of bent grass, Agrostis spp., in New Jersey.

SLIME MOLDS. Fuligo septica was reported from New Jersey. Physarum cinereum occurred in New Jersey, the District of Columbia, and Mississippi.

S U N F L O W E R

RUST (Puccinia helianthi) was reported much worse than in former years in Massachusetts where it caused 10 per cent loss. In Connecticut it was frequently seen on the wild species of Helianthus and was reported once as common on the cultivated H. annuus. Because of the dry season it was less prevalent in Wisconsin than in average years.

STEM ROT (Sclerotinia sclerotiorum). Washington.

POWDERY MILDEW (Erysiphe cichoracearum) was more prevalent than in 1933 or in average seasons in Massachusetts. It was less prevalent than usual in Wisconsin.

D I S E A S E S O F F R U I T S A N D N U T S

A P P L E

SCAB (Venturia inaequalis). Twenty-six States reported the presence of apple scab. Of these, Maine, New York, New Jersey, Georgia, and Western Washington gave no comparative figures. Delaware, Maryland, and Western Oregon reported increased prevalence; New Hampshire, Connecticut, and Virginia recorded the usual amount; while Massachusetts, West Virginia, Kentucky, Tennessee, Arkansas, Ohio, Illinois, Indiana, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, and Kansas noted less or much less than in average years. The following remarks were characteristic explanations offered. Illinois: The season of 1934 was unique in that injury from the common fruit diseases was almost entirely eliminated not by spraying but by the very dry weather which prevailed throughout the growing season. Kentucky: The spring was dry in Kentucky, so much so that scab infections are extremely rare on unsprayed apples. See P.D.R. 18: 33, 41, 47, 79, 97, 98, 103, 108, 109, 117, 118, 125, and 163. Those States reporting losses of over 1 per cent were Tennessee, 10; Virginia, 8; Maryland, 5; Wisconsin, 5; Massachusetts, 3.

BLOTCH (Phyllosticta solitaria). Blotch was reported from New Jersey, Delaware, Maryland, Virginia, Tennessee, Mississippi, Ohio, Indiana, Illinois, Wisconsin, Iowa, Missouri, and Arkansas. With the exception of Delaware where more was reported, and Tennessee, Mississippi, and Iowa, where the usual amount was noted, the States reported less than in an average year as indicated by such remarks as--Virginia: less; precipitation low in May, June, and July. Arkansas: Leaf and fruit lesions practically non-existent in commercial districts. Illinois: Blotch was rare even on

those varieties susceptible to the disease. Wisconsin: Less, too dry. Kansas: much less; very little observed.

APPLE RUST (Gymnosporangium spp.) was reported to be so much more prevalent than usual in Ohio that growers did not recognize it as rust. In Indiana, the disease was general and severe; with slight infection even on resistant varieties. It occurred in Connecticut and Delaware and was less prevalent than usual in Massachusetts, Virginia, West Virginia, Kentucky, Georgia, Wisconsin, Minnesota, and Kansas due to the lack of early spring rains and the consequent failure of the spore horns to gelatinize while the foliage was coming out. Extensive cedar cutting reduced the amount of the disease in Virginia. G. clavipes was reported from New Jersey, Tennessee, and Mississippi. G. globosum was noted in New Hampshire. P. D. R. 18: 13, 58, 98, 109, 117, 118, 163.

BLACK ROT (Physalospora obtusa) was more prevalent than usual in Virginia, Tennessee, and Indiana. Elsewhere there was the usual prevalence, or less. Average losses were recorded as follows: Massachusetts, Virginia, Tennessee, 3 per cent, Ohio, 2, and Maryland, 1.5. According to J. C. Dunegan and M. A. Smith, the disease was practically absent from Arkansas and Missouri. Other States recording its presence are New Jersey, Delaware, West Virginia, Mississippi, Wisconsin, Minnesota, Kansas, and Washington. P. D. R. 18: 108; 19: 2-7.

BITTER ROT (Glomerella cingulata) was reported to be more prevalent than usual in West Virginia due to late summer local showers, and in Tennessee; less prevalent in Arkansas and Indiana due to drought and high temperatures; about the same in Maryland, Virginia, Mississippi, and Ohio. It was reported as severe on Grimes Golden, Winter Banana, and Maiden Blush varieties in New Jersey; common on Stark in Delaware, and occurring in Georgia. P. D. R. 18: 117, 157, 165.

BLIGHT (Bacillus amylovorus) was reported from 20 States. It was more prevalent than in 1933 in Maryland, Tennessee, Mississippi, Indiana, Illinois, and Montana; less severe in Massachusetts, Connecticut, Virginia, Michigan, Wisconsin, Minnesota, and Kansas; and occurred in about the usual amount in Arkansas, Ohio, North Dakota, and Wyoming. Incidence was reported in New Jersey, and locally in the Manson district in Washington. R. E. Vaughan reports that campaigns for pruning out cankers following harvest are gaining in popularity in parts of Wisconsin. Application of a 1-3-50 Bordeaux mixture when 25 per cent of the blossoms were open resulted in appreciable reduction of blossom blight in New Jersey. Blossom blight on Jonathans was destructive

enough to ruin the entire crop in some orchards in Illinois. Average percentage losses were reported as follows: Tennessee and Ohio, 5; Maryland, 3; Massachusetts, Indiana, and Wisconsin, 2; North Dakota, 1.5; Virginia, 1. See P. D. R. 18: 2, 13, 98, 109, and 125.

CROWN GALL (Bacterium tumefaciens) was reported from New Jersey, Maryland, Tennessee, Georgia, Wisconsin, Minnesota, and Kansas.

POWDERY MILDEW (Podosphaera leucotricha) caused as high as 25 per cent fruit loss on the Jonathan variety in a few orchards in Washington, although the average loss was less than 5 per cent. This was the worst mildew year since 1928. The disease was also severe in New Jersey on Astrachan, Winesap, and Transparent varieties. It was not observed in Minnesota.

FRUIT SPOT (Mycosphaerella pomi) was noted in New Jersey, very severe on unsprayed trees; also in Delaware, Maryland, and Ohio.

BITTER PIT (non-par.) was reported from Massachusetts, New Jersey, Maryland, Wisconsin, and Washington.

SOOTY BLOTCH (Gloeodes pomigena) was much more prevalent in Delaware, Maryland, and Tennessee than in an average year. Its presence was also noted in New Hampshire and New Jersey.

FLY SPECK (Leptothyrium pomi); Maryland, Tennessee, and Wisconsin, caused very little damage.

ANTHRACNOSE (Neofabraea malicorticis). In Oregon, it was readily controlled in orchards sprayed with Bordeaux mixture, but in neglected orchards it caused considerable damage. Many young trees were so severely damaged that their removal will be necessary. Washington also reported its presence.

HYPOCHYDRIOSE (Corticium stevensii) was reported as occurring on unsprayed trees in Georgia.

ROOT ROT (Xylaria sp.). In Georgia in one orchard of 600 Golden Delicious trees, 200 died in their sixteenth to twentieth years from this cause. Tennessee reported 3 per cent loss for the State with a maximum infection in one orchard of 25 per cent.

STEM ROT (Sclerotium rolfsii) was reported as killing three young apple trees in Virginia.

MEASLES (cause unknown) was reported from New Jersey and Ohio.

WINTER INJURY was severe in the Northeast. Killing of trees, or die-back, and spur injury were reported from Maine, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Virginia, and Wisconsin. Die-back and frost injury were reported from Washington. P. D. R. 18: 34, 35, 36, 37, 123.

DROUGHT INJURY. A report on the effect of drought and high temperatures on fruit crops in the Ozark region of Arkansas and Missouri is given in P. D. R. 19: 2-7. Scald due to high temperature and drought was reported from New Jersey. Growth cracks caused unusual damage to Stayman Winesap apples in certain orchards in Tennessee, where the last half of July and the month of August were exceptionally dry, followed by heavy rains early in September. Water shortage was reported as the cause of a drought spot in Washington.

Virginia reported internal cork was again common on Ben Davis for the first time since 1930. 1934 had more days over 100° F. than 1930, and many over 90°. Most of the loss was on high ground. The loss in grade for Ben Davis was estimated at 20 per cent, with a maximum incidence of 95 per cent.

West Virginia reported an internal browning of Ben Davis and Gano varieties as probably causing more loss than all other conditions combined. The injury was attributed to the dry summer, low humidity, and high temperatures.

WATER CORE (non-par.) was reported as severe on Transparent and Northern Spy varieties in New Jersey and prevalent on Duchess in Delaware.

INFECTIOUS CHLOROSIS or VARIEGATIONS (virus) was observed in Benton County, Washington.

ROOT KNOT (Heterodera marioni) occurred generally distributed in Mississippi.

ROOT ROT (Undetermined cause). Reported from north Georgia where a fungus with a white mycelium was associated with the dead lateral roots of the dying trees.

In Raglan township, Iowa, a root rot of undetermined cause has appeared on areas from a quarter to two acres in extent where the trees are killed. Some of these spots have been replanted as many as three times.

P E A R

SCAB (Venturia pyrina). Massachusetts, New Jersey, Virginia, Ohio, Wisconsin, and Kansas each report less than usual; Connecticut, Maryland, and Washington, the average amount; in no case was the estimated loss above 1 per cent.

In Oregon, according to L. R. Childs, "The increase in pear scab that occurred in various parts of the Hood River Valley during the past season without question presents the most important unsolved problem in the control of disease within this district. The fungus has been gradually spreading from two or three rather insignificant infections in 1930 and 1931 to the extent that it now involves several hundred acres in two important pear sections of the district. The Anjou pear, the most important variety, appears to be the most susceptible. At the present time, we have no satisfactory means of control owing to the fact that this variety is injured by our most effective spray applications. It is estimated that at least 5 per cent of the crop of the district was affected, ranging up to 50 per cent loss in the centers of attack."

BLIGHT (Bacillus amylovorus). Of the 13 States reporting on the comparative prevalence, 3, Mississippi, Louisiana, and Arkansas observed much more than usual; 7, Maryland, Virginia, Tennessee, North Georgia, Ohio, Michigan, and Kansas noted less; and Massachusetts, Connecticut, and Wisconsin estimated about the same as usual. New York, Illinois, and Washington also reported the presence of the disease. Estimated percentage losses ran as follows: Tennessee, 20 per cent; Massachusetts, 7; Virginia, 5; Michigan and Maryland, 1; and Ohio, .5. See P. D. R. 18: 13, 96, and 97.

LEAF BLIGHT (Fabraea maculata). Delaware reported much more than usual with as high as 50 per cent defoliation on unsprayed trees. There was less infection than normal in New Jersey, Louisiana, and in Illinois, where general absence was reported. Virginia reported less than in 1933 but about the usual amount. Maryland recorded 4 per cent loss.

LEAF SPOT (Mycosphaerella sentina). In Georgia, 100 per cent infection was observed in nurseries on leaves from shoots below the graft and none on the scion. It was also reported from Kansas.

RUST (Gymnosporangium globosum). Connecticut reported Sand pear as being a new host for the State.

THREAD BLIGHT (Corticium koleroga) appeared for the first time in the State of Louisiana.

CANKER (Septobasidium retiforme), Mississippi.

SOOTY MOLD (Fumago vagans) was very common in New Jersey generally following aphid injury.

STORAGE ROTS (Penicillium, Botrytis, Gloeosporium, and Cladosporium) caused 15 per cent loss in Massachusetts.

BLACK POX (Helminthosporium papulosum) was reported from Mississippi, where it occurred at Yazoo City. The fungus was determined by Dr. Anthony Berg.

ROOT ROT (Armillaria mellea) was again observed locally in Mississippi.

COLLAR ROT (Undetermined). Louisiana reported general distribution of a collar rot of undetermined cause which has been under investigation for the past three seasons.

BLACK-END, ROUGH-BARK, RUSSETTING AND STONINESS (non-parasitic), reported from Washington.

Q U I N C E

BLIGHT (Bacillus amylovorus) appeared to be unusually destructive in Massachusetts and Virginia. Its presence was also noted in Connecticut and New Jersey.

RUST (Gymnosporangium clavipes). Mississippi.

CROWN GALL (Bacterium tumefaciens). New Jersey.

LEAF SPOT (Fabraea maculata). One hundred per cent infection was observed in two orchards in New Jersey. Present in Connecticut.

P E A C H

LEAF CURL (Exoascus deformans). Dry, warm weather which prevailed during early spring in most peach growing sections, limited the severity of leaf curl. It was reported from Massachusetts, Connecticut, Delaware, Maryland, Virginia, West Virginia, Kentucky, South Carolina, Mississippi, Louisiana, Arkansas, Ohio, Indiana, Illinois, Michigan, and Washington. Kansas reported that it was not observed. Arkansas stated that fruit infections were unusually common in unsprayed orchards. Not more than a

trace of loss was reported generally, the highest estimate being 0.5 per cent in Massachusetts. Mississippi and Louisiana were the only States in which normal prevalence was recorded; other States reported less or much less than usual.

BROWN ROT (Sclerotinia fructicola). South Carolina reported more than usual and Mississippi and Ohio noted the usual amount. It was common in New Jersey on the few peaches that survived the cold winter. Massachusetts, Maryland, Virginia, Tennessee, Georgia, Arkansas, Illinois, Michigan, Missouri, and Colorado observed less or much less than the usual amount and Kansas stated that none was noted but there were practically no peach fruits. The blossom blight phase was very destructive locally in the vicinity of Augusta, Arkansas. The average percentage losses reported were, Tennessee, 10; South Carolina, 1 to 2; Ohio, 1; and Maryland, .5.

BACTERIAL SPOT (Bacterium pruni). Incidence of this disease was recorded in Massachusetts, Connecticut, New Jersey, Delaware, Maryland, Virginia, Georgia, Mississippi, Arkansas, Ohio, Illinois, and Kansas. The loss was negligible, 1 per cent being the greatest average loss reported.

SCAB (Cladosporium carpophilum) was more prevalent in Tennessee and South Carolina than it was in 1933 or than in an average year. The loss reported for each of these States was 5 per cent. Massachusetts reported bark infections only as there was no fruit crop. Virginia, Indiana, and Michigan reported less than the usual amount. In Arkansas, Illinois, and Kansas the disease was not observed. The low incidence was correlated with a short crop of fruit resulting from the severe winter. Scab was generally distributed in New Jersey and severe in a few localities in the southern part of the State. Delaware, Ohio, and Mississippi report about the usual prevalence.

POWDERY MILDEW (Podosphaera oxycanthae). Several cases were observed in New Jersey.

ROOT ROT (Armillaria mellea) was reported from Mississippi.

YELLOW, LITTLE, RED SUTURE (virus diseases). In Michigan, 568,558 trees were inspected in 18 counties. Yellow was found in 410 trees, little in 3,671, and red suture in 224. (P. D. R. 19: 28). Yellow was reported also in New Jersey, Pennsylvania, Maryland, and Virginia. In Pennsylvania, 311 orchards with 514,279 trees were inspected in 13 counties, and 421 trees or .081 per cent were marked for yellows. K. W. Lauer of the Pennsylvania Department of Agriculture reported:

"Apparently the biennial inspection plan is working out satisfactorily since the percentage of yellows found this year is .081 per cent compared with .135 per cent found last year. In only one year was the percentage of yellows lower than this season and that was in 1930 when it was .078 per cent. The percentage this year would have been considerably lower if the owner of orchard No. 10 in Dauphin County would have removed the trees marked for yellows in 1931 and 1932. In 1932 there were 6 trees marked for yellows in the same orchard. The records also show that in both these years the owner did not remove all the marked trees. In 1933, this orchard was not inspected. This year (1934) there were 425 trees in the orchard and 168 of these were marked for yellows. The percentage of yellows is highest in Dauphin County, due of course to the condition of this orchard.

"An interesting fact which has developed is the average age increase of peach trees within the State. Beginning with the year 1923 when records of this nature were started, the average age of the Pennsylvania peach tree was 5.66 years. With the adoption of modern disease and insect control and cultural methods by the orchardist, the average age of the peach tree has been increased to 8.21 years in 1934. It is not claimed that the peach yellows inspection service is alone responsible for this average age increase but it is felt that it has contributed an important part."

ROSETTE (virus). Mississippi.

MOSAIC (virus) was discovered in May, 1934, in the Palisade district of Mesa County, Colorado. It had previously been known to occur only in Texas. Inspection of all peach orchards, or approximately 350,000 trees, in the section located 6,500 infected trees. Eradication of diseased trees was started June 20. This outbreak is recognized as a serious menace to the important peach-growing region along the Colorado River east of Grand Junction.

PHONY PEACH (virus). During 1934, the inspection of commercial and home orchards was limited to the States of Georgia, Louisiana, and Texas. In commercial orchards, 4,650,420 trees were inspected, and 98,621 infected trees were found, of which 96,072 were in Georgia, 2,183 in Louisiana, and 366 in Texas. In home orchards in the same States, 68,116 trees were inspected and 3,062 were found to be infected. Of these infected trees, 2,133 were in Georgia, 794 in Louisiana, and 135 in Texas.

During the year, 143 nurseries, and the environs thereof, were inspected in the States of Tennessee, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Texas, Arkansas, Illinois, and Missouri. Two hundred and eighteen trees were found to be infected with phony peach disease. The States in which such infections

were found are Tennessee, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Texas, and Arkansas.

During the last half of the 1934 growing season, an intensive and extensive survey to delimit the spread of the disease was started, but up to the close of the season the survey had not resulted in the discovery of infection in States other than those where it was previously known to exist. (Bureau of Entomology and Plant Quarantine).

GUMMOSIS (Undetermined) was reported from New Jersey, Colorado, and Washington.

WINTER INJURY. Severe injury which led to nearly a complete loss of the peach crop occurred in Massachusetts, Connecticut, New York, New Jersey, West Virginia, Pennsylvania, Kentucky, and Illinois. P. D. R. 18: 35, 36, 37, and 38.

DROUGHT INJURY in the Ozark region of Missouri and Arkansas. P. D. R. 19: 2-7.

P L U M

BROWN ROT (Sclerotinia fructicola) seemed to be less prevalent in Massachusetts, Connecticut, Maryland, Ohio, Wisconsin, Minnesota, and Kansas on account of dry weather. Only one specimen was observed in Minnesota, one in Connecticut, and none in Kansas. Average percentage losses, as reported, were Tennessee, where spraying was generally neglected, 75; Massachusetts, 5; Ohio, 2; Maryland, 1. It was prevalent and severe in some cases in New Jersey and also occurred in Washington.

CROWN GALL (Bacterium tumefaciens). Maryland reported a trace and Minnesota that it was not seen.

BACTERIAL SPOT (Bacterium pruni). No appreciable damage was reported as having been caused by bacterial spot. Its incidence was recorded in Massachusetts, New Jersey, Maryland, Ohio, Mississippi, and Wisconsin. Minnesota stated it was not observed.

PLUM POCKET (Exoascus communis) was recorded in Georgia, Wisconsin, Minnesota, and North Dakota.

HYPERTROPHY (Exoascus mirabilis). Mississippi and Louisiana.

BLACK KNOT (Plowrightia morbosa). Connecticut, New Jersey, Maryland, Tennessee, and Wisconsin; was of little economic importance.

SHOT HOLE (Coccomyces prunophorae). Minnesota and Kansas.

SCAB (Cladosporium carpophilum). Wisconsin.

LITTLE PLUM (virus). Donald Cation reported that considerable trouble diagnosed as little plum occurred in the vicinity of Novi, Michigan on Burbank plum.

C H E R R Y

LEAF SPOT (Coccomyces hiemalis) was recorded as being less prevalent than usual in Massachusetts, Maryland, Georgia, Ohio, Indiana, Illinois, Michigan, and Kansas. Such remarks as this were made: Illinois: There is a general absence of cherry leaf spot. Kansas: Very little. Indiana: Conspicuously absent on both bearing trees and on nursery seedling stocks. Connecticut, New Jersey, Tennessee, Wisconsin, and Washington noted the presence of the disease.

BROWN ROT (Sclerotinia fructicola). Maryland, Ohio, Indiana, Michigan, Wisconsin, and Kansas report less prevalence than usual due to dry weather. Massachusetts and Connecticut report the usual prevalence with 20 per cent loss for the former. Other States reporting its incidence are New Jersey, Delaware, Virginia, and Washington.

BACTERIAL SPOT (Bacterium pruni). Iowa and New Jersey.

RUST (Tranzschelia pruni-spinosae /T. punctata7). Severe leaf infection was reported in Georgia.

LEAF CURL (Taphrina farlowii). Georgia.

ROOT ROT (Armillaria mellea). About twelve trees died near timbered areas in Michigan. Its presence was also noted in Washington.

WINTER INJURY was severe in several localities. Wisconsin: 25 per cent loss due to injury to buds in March. Kansas: Very severe, hundreds of trees died. Many lost leaves before the fruits ripened. See P. D. R. 18: 35, 36, and 119, for reports from New York and Virginia. Massachusetts, Connecticut and New Jersey also reported injury.

M U L B E R R Y

BLIGHT (Bacterium mori) was found on seedlings from a nursery in Iowa.

CANKER (Fusarium sp.). A tree of Morus alba with a thousand or more cankers was observed in New Jersey. Fusarium sp. was found fruiting on the cankers.

G R A P E

BLACK ROT (Guignardia bidwelli) was less prevalent than in usual years in Massachusetts, New Jersey, Maryland, Arkansas, Ohio, Michigan, Wisconsin, and Kansas. The following remark from Arkansas was characteristic of the other reports: "Minor importance due to dry weather." However, black rot was reported to be more prevalent in Connecticut and Tennessee. It was not observed in Minnesota but was reported from Pennsylvania, Delaware, Georgia, and Mississippi. Average percentage losses, as reported, were Massachusetts, 8; Maryland, 5; Tennessee, 50; South Carolina, 25; Florida, 17; and Ohio, 2.

DOWNY MILDEW (Plasmopara viticola) was generally less prevalent than usual due to dry and hot weather during the months of July and August. Those States reporting less were: Massachusetts, Maryland, Florida, Arkansas, Ohio, Michigan, and Minnesota. Georgia and New Jersey reported it as being severe locally and its presence was noted in Connecticut, Delaware, and the District of Columbia. The fungus was found in abundance on the California wild grape, Vitis californica, in California, apparently for the first time since it was collected by Harkness in 1889. It has never been recorded on cultivated grape in California (P. D. R. 18: 123).

ANTHRACNOSE (Elsinoe ampelina [Sphaceloma ampelinum]) was observed in Maryland, Florida, Mississippi, Arkansas, and Minnesota, but apparently was of little importance.

BITTER ROT (Melanconium fuligineum) caused 20 per cent loss with a maximum infection of 90 per cent in one planting in Florida.

WEATHER INJURY. In Arkansas, grape diseases were largely non-parasitic. Drought injury to the vines, shelling, cracking, and uneven ripening of the bunches very materially reduced the size and quality of the crop. Hail and wind caused complete losses in some vineyards.

STRAWBERRY

LEAF SPOT (Mycosphaerella fragariae) was reported as less prevalent in Massachusetts, Ohio, Michigan, Wisconsin, and Minnesota, due to dry weather. In Louisiana there was much more than usual due to cool and very wet weather from the second week of March to the end of the third week of April. Connecticut, New Jersey, Maryland, Mississippi, North Dakota, and Washington note about the same as usual. The loss in Louisiana was estimated at 10 per cent. Other loss estimates were 5 per cent in Virginia and North Carolina, 2 in Massachusetts, Pennsylvania, Minnesota, and Oregon, 1 in Maryland and Texas, 0.1 in Ohio, and traces in Illinois, Michigan, Wisconsin, North Dakota, and Montana.

LEAF SCORCH (Diplocarpon earliana). No appreciable damage was reported as having been caused by this disease. Its incidence was recorded in Maryland, North Carolina, Florida, Louisiana, Ohio, and Wisconsin.

ANTHRACNOSE (Colletotrichum fragariae), in Florida, was the most destructive disease of plants in the nursery beds due to the girdling of young runners, and in the early set plants in the field during September and October it caused rhizome rot resulting in wilt. Spraying is not efficacious under prevailing weather conditions of Florida.

LEAF BLIGHT (Dendrophoma obscurans). Slight infection was observed in a number of fields throughout Minnesota.

POWDERY MILDEW (Sphaerotheca humuli), Washington.

BOTRYTIS FRUIT ROT (Botrytis cinerea). In Louisiana, approximately half of the berries rotted during a period of cool, wet weather the first two weeks of April. Botrytis caused probably 95 per cent of all the berry rots in the State or a total loss of 15 per cent. Its incidence was also recorded in Massachusetts, New Jersey, North Carolina, Florida, Mississippi, and Colorado. In North Carolina fruit rots due mostly to Botrytis and Rhizopus caused a loss of 8 per cent.

FRUIT ROT (Rhizoctonia sp.). Florida and Kansas.

BLACK ROOT and ROOT ROTS (undetermined) were reported generally prevalent where strawberries are grown. Wisconsin reports 25 per cent loss due to poor snow coverage. Other loss estimates were 15 in Maryland, 10 in Virginia and North Carolina, 9 in Massachusetts, 8 in Pennsylvania, 7.5 in Washington, 5 in Illinois, Montana, and Oregon, 3 in Texas, 1.5 in Florida, 1 in Michigan and Minnesota,

0.5 in Louisiana, and a trace in Colorado.

CROWN ROT (Sclerotinia sclerotiorum). There was much more in Louisiana than usual due to excessive rains and low temperature during the last two weeks of March and the first two of April.

STEM ROT (Sclerotium rolfsii) was more prevalent than usual during the fruiting season in Florida. Its presence was observed in North Carolina.

ROOT ROT (Diplodia sp.). Florida.

DWARF (Aphelenchoides fragariae) was reported from Massachusetts, North Carolina, Florida, and Louisiana.

LEAF VARIEGATION (Undetermined) was reported from Massachusetts, Maryland, Louisiana, Arkansas, and Minnesota on the Blakemore variety. (P. D. R. 18: 26, 43, 46, 98, 109).

MOSAIC (virus) was less prevalent in Wisconsin than usual. A suspected mosaic was reported from Mississippi.

WITCHES BROOM (virus?). Minnesota and New Jersey.

CRINKLE (virus). Washington and Oregon.

YELLOW S (virus). New Hampshire, Minnesota, and Washington.

SLIME MOLD (Fuligo septica). New Jersey.

WEATHER INJURY caused 85 per cent loss in Minnesota due to very dry weather both in the fall and spring and the lack of snow cover.

DISEASE COMPLEX. Oregon. The combined development of various strawberry diseases, principally *Rhizoctonia* and probably crinkle together with the occurrence of cyclamen mite have become so devastating in the Hood River Valley of Oregon that it is now no longer profitable to grow the Clark Seedling strawberry which for more than a quarter of a century has been the backbone of the strawberry industry in that region. The activities of these various agencies have been such that the variety no longer produces enough to compete with berries grown in other sections. (LeRoy Childs).

R A S P B E R R Y

ANTHRACNOSE (Elsinoe veneta /Plectodiscella veneta/) was much more severe than in average years in Pennsylvania where it caused 55 per cent loss. It was reported less prevalent than usual in Connecticut, Maryland, Kentucky, Ohio, Illinois, and Wisconsin, due to dry weather. Its presence was reported in Massachusetts, New Jersey, Arkansas, and Minnesota.

LATE RUST (Pucciniastrum americanum) which was very prevalent in 1933, was scarcely observed in Massachusetts, Delaware, Illinois, and Wisconsin.

WESTERN RUST (Phragmidium rubi-idaei /P. imitans/). Washington.

ORANGE RUST (Gymnoconia peckiana) was severe locally in Pennsylvania and was reported from Maryland, Wisconsin, and Minnesota.

POWDERY MILDEW (Sphaerotheca humuli). No appreciable damage was reported as having been caused by this disease. Its incidence was recorded in Connecticut, Michigan, Minnesota, and Washington.

LEAF SPOT (Mycosphaerella rubi) was common in New Jersey; caused 50 per cent defoliation on Chief and 10 per cent on Latham in Delaware where heavy dews and rains favored its spread; combined with red spider it caused serious defoliation in Latham plantings in southern Illinois where it developed rapidly during rainy periods in August. Very little development occurred in Kansas due to the dry hot season. Valteau, commenting on this disease in Kentucky, states that, "It defoliated most old plantings of Latham in 1933 resulting in severe winter killing and low yield this year. Plantings were nearly free from leaf spot this year until after harvest when rains set in and soon defoliation became extensive. Unsprayed plantings were nearly completely defoliated by fall, whereas plantings or rows sprayed following harvest and subsequently held their foliage very well. In 1933 and 1934 the post-harvest sprays beginning immediately after harvest and continuing until about September one were the most effective."

CROWN GALL (Bacterium tumefaciens). Incidence and the amount of loss of this disease was recorded in Minnesota, 10 per cent; Pennsylvania, 5; Ohio, and Kansas, 2; Massachusetts, 1.5; Maryland, trace. It was also reported from Michigan and Wisconsin.

SPUR BLIGHT (Didymella applanata). Massachusetts, Connecticut, New Jersey, and Minnesota.

CANE BLIGHT (Leptosphaeria coniothyrium) caused 5 per cent loss locally in Pennsylvania. It was reported but caused no appreciable damage in Massachusetts, Maryland, Ohio, and Kansas.

WILT (Verticillium alboatrum). New Jersey and Ohio.

DOUBLE BLOSSOM (Fusisporium rubi). Maryland.

LEAF CURL (virus) was reported more or less generally prevalent in Massachusetts, Maryland, Ohio, Wisconsin, Minnesota, and North Dakota. Estimated damage, Massachusetts, 20 per cent; Ohio, 4; North Dakota and Maryland, 1.

MOSAIC (virus) was generally neither more nor less prevalent than usual. Its occurrence was reported from Connecticut, Arkansas, Ohio, Wisconsin, Minnesota, Kansas, and Washington. Those States reporting more than a trace of loss were: Ohio and Minnesota, 5 per cent, and Pennsylvania, 4. Kansas notes that nurseries are much freer of mosaic than a few years ago.

STREAK (virus) caused 2 per cent injury in Ohio.

WINTER INJURY. Minnesota reports 60 per cent loss. Plants were completely killed in many cases in the south due to drying out and freezing. In the north, snow protected the roots, but due to late rains, the canes were soft and many froze back to the snow line. Massachusetts, Kentucky, and Illinois report severe injury, Connecticut and New Jersey also reported injury, while in New York raspberries wintered in fine shape.

B L A C K B E R R Y

RUST (Gymnoconia peckiana) was reported from New Jersey, Pennsylvania, Mississippi, Arkansas, Illinois, Wisconsin, Minnesota, Kansas, and Washington as of minor importance except in Illinois where it was considered an outstanding disease on the cultivated plantations.

LEAF SPOT (Mycosphaerella rubi) occurred sparingly in Connecticut, New Jersey, and Kansas.

BLOTCH (Cercospora rubi). Louisiana.

DOUBLE BLOSSOM (Fusisporium rubi). New Jersey, not of great importance due to the fact that Black Diamond variety was largely destroyed by winter injury.

ROSETTE (Cercospora sp.). Louisiana.

GRAY MOLD (Botrytis cinerea) was severe on certain plants in New Jersey and was also reported from Washington.

CROWN GALL (Bacterium tumefaciens). Wisconsin and Washington.

MUSHROOM ROOT-ROT (Armillaria mellea). Washington.

MOSAIC (virus). New Jersey.

STREAK (virus). Pennsylvania.

D E W B E R R Y

ANTHRACNOSE (Elsinoe veneta [Plectodiscella veneta]) was very serious in some plantings in New Jersey. RUSTS (Gymnoconia peckiana and Kuehneola uredinis) were reported from New Jersey; CANE BLIGHT (Leptosphaeria coniothyrium) from Louisiana; LEAF SPOT (Mycosphaerella rubi) from Mississippi; DOUBLE BLOSSOM (Fusisporium rubi) from New Jersey.

C U R R A N T

ANTHRACNOSE (Pseudopeziza ribis) caused 100 per cent defoliation in one field in New Jersey, although the loss to the State was little. Its presence was also reported from Wisconsin and Washington.

G O O S E B E R R Y

ANTHRACNOSE (Pseudopeziza ribis). Illinois and Wisconsin report much less than usually. It was very abundant where prevalent in New Jersey and was also reported from Washington.

RUST (Puccinia caricis) was reported generally from Connecticut, New Jersey, and Wisconsin, but caused little damage.

LEAF SPOT (Mycosphaerella grossulariae) was reported from Kansas and Wisconsin as being less prevalent than usual.

POWDERY MILDEW (Sphaerotheca mors-uvae). Wisconsin and Washington.

C R A N B E R R Y

FALSE BLOSSOM (virus) was found on a number of bogs in the Annapolis Valley of Nova Scotia, for the first time.

STORAGE ROTS. The following summaries were furnished by members of the Division of Fruit and Vegetable Crops and Diseases.

Massachusetts: The total spoilage due to fungous rots was less in 1934 than in 1933. Glomerella cingulata vaccinii was the most important fungus causing spoilage. Godronia cassandrae (end rot) was usually second in importance. Sporonema oxycocci and Phomopsis were important causes of spoilage on some bogs, in some instances causing a loss equal to or exceeding that due to Godronia. Acanthorhynchus vaccinii and Guignardia vaccinii were negligible. (H. J. Bergman)

Wisconsin: The Wisconsin cranberry crop of 1934 was of the poorest keeping quality in a 5-year period, judging from the results of consecutive keeping experiments with berries from several widely scattered marshes. The end-rot, Godronia cassandrae, annually causes the major part of cranberry storage loss in Wisconsin. These figures, applying to dry-raked and water-raked samples from the same marshes, cannot of course be accepted as representing the actual storage loss in the State, but since the samples for the most part came from the same marshes year after year, they do furnish an index to the relative keeping quality on representative marshes during these years. They were:

Percentage of Rot in Samples December 20

	Dry Raked	Water Raked
1934	24%	40%
1933	13	25
1932	12	28
1931	15	26
1930	13	21

The actual loss sustained by growers was not at all comparable to the indicated keeping quality of the fruit. Due to an extremely short crop in the industry as a whole, berries moved early and rapidly, both in distribution and consumption, with the result that most of the Wisconsin crop was consumed before serious storage loss had developed. (H. F. Bain)

B L U E B E R R Y

BITTER ROT (Glomerella cingulata vaccinii), New Jersey.
TWIG DIE-BACK (Botrytis sp.)? Washington.

C I T R U S

STEM-END ROT, MELANOSE AND SHELL BARK. (Diaporthe citri /Phomopsis citri, P. californica). In Florida, regular and heavy rains during the spring produced a very severe degree of fruit blemish. The loss on grapefruit was estimated at 14 per cent from melanose and 10 per cent from stem-end rot. On oranges, the loss from melanose was 12 per cent while stem-end rot caused 8 per cent loss. Melanose on orange was reported from Louisiana and on grapefruit from Mississippi. Shell bark was noted on lemon in California.

CITRUS SCAB (Sphaceloma fawcettii) was reported to be more prevalent in Florida on tangerines, lemons, limes, grapefruit, tangelos; and King oranges than during a usual year. It was also reported on Satsuma oranges from Louisiana.

BLAST (Bacterium syringae /B. citriputae) occurred in northern California.

LEAF SPOT (Phyllosticta sp.) on lemon was reported from New Jersey.

BROWN ROT GUMMOSIS (Phytophthora citrophthora) was reported from California.

MUSHROOM ROOT ROT (Armillaria mellea). All varieties of citrus are susceptible in California.

MOTTLE LEAF (Malnutrition). General in nearly all districts of California. A spray of zinc sulphate and lime is proving a remarkable corrective.

PSOROSIS (virus)? California.

GRANULATION (cause unknown). California reports a physiological trouble on Valencia oranges, which causes a hardening of the juice sacs at the stem end of the fruit.

B A N A N A

PANAMA DISEASE (Fusarium cubense) appeared to be more abundant in Puerto Rico than usual. ANTHRACNOSE (Gloeosporium musarum) was common and widespread in Puerto Rico. FRUIT FRECKLE (cause unknown) was common on the Manzana variety in Puerto Rico. Cercospora musarum was isolated from the lesions.

F I G

THREAD BLIGHT (Corticium koleroga) was very destructive in southwest Louisiana and was also reported from Florida. LIMB BLIGHT (Corticium salmonicolor), Florida. TWIG BLIGHT (Stilbum cinnabarinum), Louisiana. RUST (Physopella fici), Louisiana. ANTHRACNOSE (Glomerella cingulata), Mississippi.

P E R S I A N W A L N U T

BACTERIAL BLIGHT (Bacterium juglandis) was less prevalent than usual or than last year in Oregon. Moisture conditions were only moderately favorable to the disease except in certain localities. Timely spraying with Bordeaux 3-3-50 reduced the incidence of blight on the nuts to a negligible quantity. The loss for the State was estimated at 20 per cent reduction in yield and 5 per cent loss in grade. It was also reported from Washington. (P.D.R. 18: 137).

LEAF SPOT (Ascochyta juglandis) occurred in a planting in Oregon, but did not cause any damage.

DOWNY LEAF SPOT (Microstroma brachysporum) occurred in Oregon.

BLUE MOLD (Penicillium sp.) was reported from Washington.

FRECKLE SPOT of the leaves, of unknown cause, but apparently non-parasitic in origin, was reported from Oregon. (P. D. R. 18: 174).

LEAF AND TWIG BLIGHT, due possibly to drought, was reported from Yakima County, Washington.

ROSETTE, cause unknown, perhaps due to zinc deficiency, occurred in Mississippi.

J A P A N E S E W A L N U T

BACTERIAL BLIGHT (Bacterium juglandis) caused 75 per cent loss of the crop on twenty bearing Japanese walnut trees (Juglans sieboldiana) in the horticultural orchard at Athens, Georgia.

P E C A N

SCAB (Cladosporium effusum) was more injurious to Schley pecans in Georgia than it had been for a period of at least eight years. Mississippi and Louisiana also report scab as being severe.

POWDERY MILDEW (Microsphaera alni) and BROWN LEAF SPOT (Cercospora fusca) were reported from Mississippi. DIE BACK (Botryosphaeria berengeriana) occurred in Louisiana.

F I L B E R T

BACTERIAL BLIGHT (Bacterium sp.) was much more prevalent in Washington and Oregon than for some years past, due to considerable rain early in the spring when the host tissue was most susceptible to attack. Many young trees from two to four years old were killed by bacterial blight. In one Oregon orchard about 10 per cent of the trees died. In older trees the disease caused death of buds and young twigs in the tops of the trees instead of girdling the trunks as is usually the case with younger trees. Bacterial blight seemed to be more prevalent on trees previously weakened from some adverse condition such as winter injury or drought. The disease was found on the Turkish filbert, Corylus colurna, in Lewis County, Washington, in most instances confined to the current year's growth, with only very limited spread in one-year-old branches. Larger branches and trunks of the Turkish filbert seem to be very resistant. A bacterial organism apparently identical with the filbert blight pathogen was isolated from a twig blight of the native wild hazel, Corylus californica, in one locality in Oregon. (P.D.R. 18: 117, 155).

POWDERY MILDEW (Phyllactinia corylea) was more prevalent than usual in Oregon, but was not of any particular consequence due probably to the lateness of the attack. It was also reported from Washington. It occurred on native wild hazel in Oregon. (P.D.R. 18: 137, 156).

LEAF SPOT (Gloeosporium coryli) was found on the native wild hazel in Oregon in 1933. It has not been noted on the cultivated filbert in Oregon although it has been reported on this host in Europe. (P. D. R. 18: 191).

MUSHROOM ROOT ROT (Armillaria mellea) caused death of a number of trees in a planting in Oregon in 1933, and other trees were badly infected. (P. D. R. 18: 4).

BROWN-STAIN (non-par.) of the nuts was much less prevalent than usual in Oregon.

C O C O N U T

BUD ROT (Phytophthora palmivora) appeared to be much more abundant than in 1933 in Puerto Rico. A very definite case of STEM DISEASE (Thielaviopsis paradoxa) occurred near Cabo Rojo in the western part of Puerto Rico.

DISEASES OF VEGETABLE CROPS

POTATO

LATE BLIGHT (Phytophthora infestans). Appreciable loss from potato late blight was reported only in Atlantic Coast States from Maryland north, and in Florida. In the northern States, dry weather prevented infection early in the year and most of the loss was due to tuber rot following late rains. In Florida, reduction in yield was more important, amounting to 6 of the 8 per cent total loss reported. Other loss estimates were 4 per cent in Massachusetts, 3 in New York and Maryland, 2 in Pennsylvania, 1 in Maine, and traces in West Virginia, North Carolina, Texas, Ohio, and Washington. New Hampshire, Connecticut, New Jersey, Wyoming, and Oregon also reported the disease. In Wyoming it occurred in irrigated fields; in Oregon only in the western section. States in which loss sometimes occurs but which reported no loss in 1934 are Virginia, Tennessee, South Carolina, Louisiana, Michigan, Wisconsin, and Minnesota.

EARLY BLIGHT (Alternaria solani) was generally reported but was not very important in most cases. In Michigan it was prevalent after the beginning of September and caused most damage in fields planted late or irrigated throughout the season. It occurred in irrigated fields in Wyoming. In one field in Columbia County, Oregon, practically all of the plants showed serious infection. Losses estimated were 25 per cent in Tennessee; 2 in Massachusetts and Ohio; 1 to 2, South Carolina; 1, North Carolina, Georgia; 0.5, Maryland, Florida, Louisiana, Texas, Michigan; and traces in New York, Pennsylvania, Delaware, Virginia, West Virginia, Minnesota, North Dakota, Montana, Wyoming, and Washington.

SCAB (Actinomyces scabies) was favored by hot dry weather and occurred in the usual amounts or more in practically every State reporting it. Loss estimates include 10 per cent in Iowa, 8 in Texas, 5 in Michigan and Wisconsin, 3 in New York and Maryland, 2 in Maine, Virginia, Minnesota, and Montana, 1 in Massachusetts, Kansas, Wyoming, and Colorado, 0.5 in Pennsylvania, Florida, and Ohio, and traces in Delaware, West Virginia, North Dakota, and Washington. In Michigan, tubers set after rains began in the fall were practically free of scab. In Minnesota the disease was especially bad on some peat soils.

BLACKLEG (Bacillus phytophthorus). Losses reported as due to blackleg are 8 per cent in Georgia, 2 in West Virginia and Michigan, 1 in Maine, New Hampshire, Virginia, North Carolina, and North Dakota, 0.5 in Florida, 0.2 in Ohio, and traces in Massachusetts, New York, Pennsylvania, Maryland, South Carolina, Louisiana, Minnesota, Kansas, Montana, Wyoming, and Oregon. The

disease was very prevalent on Irish Cobbler in Maine. Sixty-two per cent of the fields examined showed blackleg in amounts varying from 1 to 20 per cent. In West Virginia it was especially severe on Irish Cobbler in one field where it appeared in midseason and spread rapidly. This field was in corn last year. From 2 to 15 per cent occurred in most fields in Lumpkin, Union, and Rabun Counties, Georgia, but fifty per cent infection was observed in one field in Rabun County.

STEM ROT (Corticium vagum) was reported rather generally in about the usual amounts, although in Massachusetts, South Carolina, Iowa, Kansas, and Oregon, there was said to be less and in North Dakota much more than usual. Rhizoctonia injury was very prevalent in Maine in 1933 and 1934. Practically every field was affected and the stand was reduced by as much as 20 per cent in some cases. In Florida, where this is one of the most important diseases of potato, as much as 50 per cent infection was observed. Warm, dry soils in the spring reduced the amount of infection in Iowa. Similar statements were made in reports from some of the other States where there was less than usual. In Ohio most of the injury from this disease occurs on early potatoes grown in muck soils. In Michigan, early planted and late planted potatoes are most severely affected. Seed treatment and shallow covering at planting are not practiced as much as they should be in Massachusetts, according to Boyd. On the other hand, Dykstra reported that the number of farmers treating potatoes for the control of tuber-borne diseases is increasing in Oregon. Losses reported are 5 to 10 per cent in Maine, 7 in Massachusetts, 6 in West Virginia, 5 in New York, Maryland, Georgia, Florida, Kansas, and Montana, 4 in Minnesota, 3 in Pennsylvania, South Carolina, and Iowa, 2 to 3 in Colorado, 2 in North Carolina, Ohio, Texas, and Wyoming, 1 in Michigan and Louisiana, 0.6 in North Dakota, and traces in Delaware, Virginia, Wisconsin, and Washington.

WILT (Fusarium spp. usually reported as F. oxysporum). Hot, dry weather favored the development of Fusarium wilt and more or much more than usual was reported from Maryland, Ohio, Minnesota, North Dakota, and Wyoming. In no case was less than the average reported. It is likely that, as was reported to be the case in Minnesota, the prevalence of heat and drought injury made an accurate estimate of the loss from wilt alone difficult. Sixty per cent infection was observed in two fields grown from New York seed in Ohio. In North Dakota the disease was unusually severe in the Red River Valley. Fusarium eumartii was general in dry land potatoes in Wyoming. Much of the trouble formerly diagnosed as Fusarium wilt in Wisconsin is probably yellow dwarf, according to R. E. Vaughan. Losses reported are 6 per cent in Maryland, 4 in Minnesota, 3 to 4 in Colorado, 3 in West Virginia and Wyoming, 2 in Pennsylvania and Montana, 1.6 in Michigan,

1.5 in Ohio and North Dakota, 1 in Texas, traces in Massachusetts, New York, Virginia, Tennessee, North Carolina, Florida, Kansas, and Washington, and no loss in Maine, South Carolina, and Wisconsin.

TUBER ROTS (Fusarium spp.). Soft rot was prevalent before digging in fields near Athens, Monroe, and Augusta, Georgia. Five to 10 per cent of dry rot was found in a carload of Georgia grown Irish Cobblers examined at Athens in December. Dry rot was reported as general in New Jersey. In Wyoming it caused a loss of 5 per cent to potatoes in storage. Stem-end rot caused by Fusarium eumartii was reported from Michigan.

WILT (Verticillium albo-atrum) occurred in southern Michigan.

BACTERIAL WILT (Bacterium solanacearum) is an important disease in the Hastings section of Florida. A loss of 3 per cent was estimated in 1934. The varieties Green Mountain and Bliss Triumph are said to be resistant, while Spaulding Rose and Chippewa are very susceptible.

STEM ROT (Sclerotium rolfsii) was reported from Florida, Mississippi, Louisiana, and Arkansas. A loss of 0.5 per cent was reported in Florida. In Arkansas a considerable amount of tuber rot in the field seems to be associated with this organism.

STEM ROT (Sclerotinia sclerotiorum) caused a loss of 0.5 per cent in Florida.

GRAY-MOLD ROT (Botrytis, cinerea type), of tubers, Maine.

NEMATODES. Potatoes from Harrisonburg, Virginia, heavily infested with Anguillulina pratensis (Tylenchus penetrans), were sent to Dr. G. Steiner by S. A. Wingard, who stated that the grower had 1300 bushels in the same condition. A. pratensis was reported from Mississippi also. The root-knot nematode, Heterodera marioni, was reported from Washington.

VIRUS DISEASES were reported in about the usual amounts. In many cases symptoms were said to be masked due to hot weather. The use of control measures has reduced the amount of most virus diseases considerably in most States. Losses from virus diseases in general were reported as 5 to 10 per cent in Washington, 5 in Minnesota and Montana, 3 in Louisiana, 1 in Florida, and 0.5 in Delaware.

LEAF ROLL caused losses estimated at 10 per cent in Pennsylvania, 5 in Massachusetts, West Virginia, and Ohio, 3 in New York and North Carolina, 2 in Maryland, and Virginia, 1 to 2 in

Maine, 1 in Michigan and North Dakota, and traces in Montana and Colorado.

MOSAIC. Losses due to mosaic were estimated at 5 per cent in Massachusetts, 4 in West Virginia, 3 in Pennsylvania and Georgia, 2 in Maine, New York, Maryland, Virginia, North Carolina, and Wyoming, 0.5 in Michigan, and traces in South Carolina, Texas and Wisconsin. **MILD MOSAIC** was reported specifically from Georgia, Arkansas, Michigan, North Dakota, Montana, and Oregon. An increase in amount noted in Oregon was attributed to the practice of using large potatoes for table stock, and single drops for seed, as tubers from diseased hills are apt to be smaller. **CRINKLE MOSAIC** was reported from Wisconsin, and Montana, and **RUGOSE MOSAIC** from Georgia, Michigan, Wisconsin, Washington, and Oregon.

SPINDLE TUBER caused losses estimated at 2 per cent in Kansas, 0.5 in Maryland, and a trace in New York, and the disease was reported also from Georgia, Montana, and Wyoming. In New York "It is seldom seen, but occasional fields show high percentages due to the persistent use of the same seed."

YELLOW DWARF. Losses from yellow dwarf were reported as 2 per cent in New York and Michigan, 1 per cent in Ohio and Wisconsin, and a trace in Maryland. "In the severely affected area in western New York losses of 10 per cent are not uncommon. Outside of this area the occurrence of yellow dwarf is scattered and new infections are not often observed," according to K. H. Fernow. A. L. Pierstorff reported from Ohio "The percentage of yellow dwarf is dependent upon the amount in the seed. One per cent in a Michigan field showed 20 per cent in Ohio the following year." "Yellow dwarf was more severe in the northern counties and the Upper Peninsula" of Michigan according to J. H. Muncie, "than in 1933, particularly in Grand Traverse, Leelanau, and Benzie Counties. The clover and potato leaf hoppers were abundant this year." In Wisconsin, on the other hand, R. E. Vaughan reported that the loss was not so heavy as in 1933. "The weather conditions were a factor, also the introduction of improved strains into affected areas."

CURLY DWARF was reported from Georgia, **GIANT HILL** from Michigan and Oregon, **WITCHES' BROOM** from Oregon and Montana, and **CALICO** from Oregon.

TIPBURN AND HOPPERBURN (non-parasitic and leafhoppers) caused losses estimated at 15 per cent in Arkansas, 10 in New York, 8 in Massachusetts, Ohio, and Minnesota, 7 in West Virginia, 5 in Georgia, and Michigan, 3 in Pennsylvania, and Virginia, 2 in North Carolina, 0.5 in Maryland and Texas, 0.2 in North Dakota, and traces in Wisconsin and Montana.

PSYLLID YELLOWS (due to injury caused by the potato psyllid) caused severe damage to irrigated potatoes in Wyoming. The loss was estimated at 35 per cent.

UNDETERMINED. "Z" DISEASE occurred in western New York where it caused a loss of 0.5 per cent. K. H. Fernow reported "It was first observed in July, 1933 in seed from Michigan, and was also found that year in many other fields. Symptoms: Upper leaflets turn yellow, then black, rot at foot of stem, later the plant dies. Large, brown, necrotic spots occur in pith of stem, especially at the nodes (larger than in yellow dwarf). Tubers show a brown or black ring, sometimes there is hydrosis in the ring, sometimes browning in the medullary area near the stolon. Sometimes there is rot at the stem end, and occasionally a hollow tuber, also occasionally brown spots in tubers as in yellow dwarf. The disease has been reported from Ohio in New York seed but also in seed from other sources, by Tilford. The symptoms resemble those caused by Fusarium eumartii in some respects; also, in some respects, those of ring disease of Europe."

"BRONZED WILT" was reported from West Virginia, where it has appeared for two years and is rapidly increasing, according to C. R. Orton. The plants wilt and become bronzed. Internal necrosis is prominent. A Fusarium is associated but is probably secondary. A loss of 25 per cent was estimated. The disease is especially severe in Rurals.

"HAYWIRE" caused a loss of 2 per cent in Louisiana. "MORON" was reported from Michigan. LEAK was observed in New Hampshire for the first time.

BREAKDOWN (drought injury) caused 5 per cent loss in Michigan. It was most severe in light soils in the southern part of the State. INTERNAL BROWN SPOT and NET NECROSIS, due to soil deficiency, and TUBERS WITHOUT TOPS, due to nutritional disturbance, were reported from Washington. SUN SCALD caused by high temperatures at digging time was less important than usual in Wisconsin, due to cooler weather at harvest.

T O M A T O

LEAF SPOT (Septoria lycopersici) was reported generally as unimportant, except in Georgia and Pennsylvania where the loss was estimated at 10 and 5 per cent, respectively. No other State reported more than 2 per cent loss.

WILT (Fusarium lycopersici). Hot, dry weather favored the development of wilt in Kentucky, Ohio, Indiana, Michigan, Wisconsin,

and Minnesota where there was more than usual. In practically all of the other States reporting there was the average amount. F. L. Wellman reported that it was present in the Manatee County area of Florida but was less important than in some previous years. This seems to be due to two factors, - first, the use of the resistant Marglobe tomato, and second, the relative coolness of the season. Under Florida conditions in the spring of 1934, the Marglobe tomato did not bear as heavily as healthy fields of the Globe variety, and considerable comment has been made about the matter. Many of the best growers were talking about using Globe another season, since so many farmers had such good luck with this variety in small patches over the Manatee County district. In Indiana, according to R. W. Samson, the disease is becoming more widespread, and occurs further north each year. In Wisconsin, wilt occurs mostly in greenhouses. In Minnesota it was found in one home garden on light sandy soil, the second time it has ever been reported from outdoors in that State. Fusarium wilt is less prevalent in Utah than the Verticillium wilt, according to the results of a survey conducted in 1934 (P.D.R. XIX: 108).

WILT (Verticillium alboatrum) was reported only from New York and Utah. One field in Nassau County, New York, showed 100 per cent infection; elsewhere in the State damage was very slight. Verticillium wilt is very prevalent in Utah tomato growing sections. Together with Fusarium wilt it is responsible for the wilting of the large basal and central leaves with consequent sun scald of fruit and causes heavy losses. Wilting and sun scald together caused a loss estimated at 8.5 per cent (P.D.R. XIX: 108).

EARLY BLIGHT (Alternaria solani), although it was generally reported as appearing late, was rather more prevalent than usual in a number of States, including Massachusetts, Maryland, Florida, Ohio, and Indiana. In Massachusetts it was said to be unusually destructive in August although the weather was dry. It was thought that heavy dews at night favored infection of the plants weakened by drought in July and August. In Maryland the disease was severe during September, when the rainfall in 1934 was the highest on record for that month. During May, early blight was more widespread and destructive in south-central Louisiana than for several years. A late warm fall and occasional showers permitted the development of a considerable amount of fruit rot in the canning tomato area of Ohio. Early blight was the principal disease of tomatoes in southern Indiana where it appeared late. Frequent light showers favored its spread there also. A loss of 8 per cent was recorded in Massachusetts, 5 in Maryland, and 3 in Pennsylvania and Florida. Other losses reported did not exceed 2 per cent. Collar rot was reported from New Jersey, Maryland, North Carolina, and Indiana. In Indiana, its occurrence was scattered and was traceable to definite infected lots of plants from parts of the South receiving heavy rains during the growing season. Several

severe outbreaks in one canning factory acreage necessitated a considerable amount of replacement. In New Jersey it caused serious losses in only a few fields. It was severe on a few lots of plants from Georgia.

LATE BLIGHT (Phytophthora infestans) appeared later and was less prevalent than for the last two years in New England States although there was still more than usual. The loss was much less than last year. In Massachusetts, the reduction in yield was estimated at 3 per cent and the loss from fruit rot also at 3 per cent. In up-State New York it caused only a trace of damage, but in the Hudson Valley and on Long Island the loss was 2 to 3 per cent. Almost complete loss occurred in some fields in Westchester and Nassau Counties. A trace of loss was reported from Pennsylvania, where the disease occurred in the Pittsburgh area. The greatest infection observed was 40 per cent.

BUCKEYE ROT (Phytophthora terrestris) was reported from New York, Maryland, Tennessee, and Louisiana. In New York it has so far been found only at Irondequoit and Ithaca, in greenhouses first, then outdoors. In Tennessee it caused much injury in Bedford County, where it was probably favored by rainy weather.

BACTERIAL CANKER (Aplanobacter michiganense) was reported from Massachusetts, New York, New Jersey, Pennsylvania, Maryland, Mississippi, Indiana, Illinois, Michigan, Wisconsin, Colorado, and Washington. In most States its occurrence was local or scattered. The only States reporting losses of consequence were Pennsylvania with 5 per cent, and Illinois, where bacterial canker and virus diseases caused 16 per cent loss. In Michigan the disease had not been reported for six years, but in September of 1934 it was observed in three southern counties.

BACTERIAL SPOT (Bacterium vesicatorium) more than usual was reported from Delaware, Maryland, and Virginia. In Mississippi there was the normal amount. The leaf spot phase of the disease was more prevalent and serious than usual in Maryland. In eastern Virginia the very abundant rainfall during June and July was favorable for the development of the disease. A loss of 4 per cent was estimated in Virginia and 0.5 per cent in Maryland.

BLOSSOM-END ROT (non-par.) caused more loss than usual in most States reporting it, due to dry, hot weather either throughout the growing season or following wet weather earlier in the year. In New York blossom-end rot has been serious every year since 1931 because of hot dry summers. It was observed to be especially bad in ridged fields in the western part of the State. There was said to be less than usual in Maryland due to a steady supply of moisture during harvesting. Losses of more than 1 per cent reported include

15 per cent in Texas, 8 in Pennsylvania, 5 in South Carolina, Ohio, and Minnesota, 3 to 4 in New York, and 3 in Massachusetts and West Virginia.

FRUIT ROTS caused much more loss in Maryland than usual due to heavy rainfall during harvesting. The loss from all fruit rots was estimated at 20 per cent in that State. Gray mold fruit rot (Botrytis cinerea) was less prevalent than usual in greenhouses in Monroe County, New York due to cold weather and low humidity during the winter. Ripe rot (Phoma destructiva) occurred following sun scald in New York. There was more than usual in Florida where the loss was estimated at 5 per cent. Timber rot (Sclerotinia sclerotiorum) occurred in greenhouses in New York and Kansas. In one lot of tomatoes observed in a market in Atlanta, Georgia, in October, 20 per cent showed lesions of yeast rot (Nematospora lycopersici).

VIRUS DISEASES. MOSAIC was reported from Massachusetts, Connecticut, New York, New Jersey, Delaware, Maryland, Louisiana, Ohio, Wisconsin, Kansas, and Washington mostly as less prevalent than usual. Massachusetts, New York, and Delaware report it as more destructive in greenhouses than in the field. F. L. Wellman reported from Florida that "The usual large amount of tomato mosaic was present this year, and the writer believes that practically no large planting of the crop was free from its presence at the close of the season. The occurrence of the disease seems to be more and more closely correlated with handling of the vines by colored help using tobacco in the form of snuff, chewing tobacco, and cigars. About 90 per cent of the plants in most fields were infected, but losses due to this infection were hard to estimate. In some cases it was possibly 10 per cent of the crop, in others less than 1 per cent loss occurred." Loss estimates reported are 3 per cent in Massachusetts, 0.5 in Maryland and Ohio, and a trace in New York. FERN-LEAF occurred in New Jersey and Washington. STREAK was reported from New York, Ohio, Wisconsin, and Washington. SPOTTED WILT was observed for the first time in Oregon and Washington. A disease reported by R. W. Samson as RINGSPOT and said to be due to a virus appeared in epidemic proportions in southern Indiana causing die-back of the shoots, necrotic ringspotting of the leaves, and conspicuous ringspot of the fruits. CURLY-TOP (western yellow blight) was exceedingly destructive in the Pacific Northwest, Idaho, and Utah. Losses reported are 30 per cent in Utah, 45 to 90 per cent in Washington, 25 per cent in Oregon, and traces in Montana and Colorado. Accounts of its occurrence in Utah, Idaho, Washington, and Oregon are given in the Reporter, 18: 110, 131, 168, 173. (See sugar beet).

OTHER DISEASES. COLLAR ROT (Fusarium sp.), Georgia. STEM ROT (Pythium sp.), Louisiana. STEM ROT (Sclerotium rolfsii) was reported from North Carolina and Georgia. In each State it caused heavy loss in one field. LEAF MOLD (Cladosporium fulvum) was

reported from Connecticut, New York, New Jersey, Mississippi, Wisconsin, and Washington. In New York the loss in greenhouses was estimated at 3 to 4 per cent. ANTHRACNOSE (Colletotrichum phomoides), New York, New Jersey, Maryland, Indiana, and Michigan. GRAY SPOT (Stemphylium solani), 1 per cent loss in Florida. ROOT-KNOT (Heterodera marioni) was reported from New Jersey, South Carolina, Georgia, Mississippi, Ohio, Wisconsin, and Kansas. In Ohio a loss of 2 per cent was estimated by A. L. Pierstorff who said that most of the greenhouses and an increasing amount of the muck land in the State are becoming infested. Three per cent loss occurred in South Carolina.

NON-PARASITIC. Sunscald was very important in Utah (see Verticillium wilt). It was reported from New York, New Jersey, Maryland, and Washington also. In Kansas, due to hot weather, the fruit did not set, and the tomatoes were almost a total failure. In Arkansas, the crop was reduced to practically nothing, but the local supply, by drought. The loss was estimated at 80 per cent. Heavy loss was caused by drought in other States also. OEDEMA was observed in a Massachusetts greenhouse on some crosses of Lycopersicon pimpinellifolium x L. esculentum. BLOTCHY RIPENING was reported from Washington.

B E A N

A report on the occurrence of bean and pea diseases in some of the western States in 1934, by L. L. Harter and W. J. Zaumeyer, was published in the Plant Disease Reporter 19: 142-144, June 15, 1935.

BACTERIAL BLIGHTS (Bacterium spp.) were widely distributed. Losses reported were 6 per cent in Louisiana, 5 in Florida, Texas, and Michigan, 3 to 5 in New York, 4 in West Virginia and Illinois, 3 in Ohio, 2 to 3 in Colorado, 2 in Massachusetts and Pennsylvania, 1.5 in Maryland, 1 in Virginia, North and South Carolina, Minnesota, and Wyoming, and a trace in Wisconsin, North Dakota, Montana, and Washington. The common bacterial blight (Bacterium phaseoli) was most often reported, and was said to be most prevalent in Maryland and Louisiana. Halo blight (B. medicaginis phaseolicola) was responsible for practically all of the loss due to bacterial blights in New York. The common blight was said to be generally distributed in that State, and bacterial wilt (B. flaccumfaciens) and blight due to B. vignae (= B. syringae) occurred in scattered localities, but each caused only a trace of loss. Halo blight was also reported specifically from Massachusetts, Louisiana, and Montana.

ANTHRACNOSE (Colletotrichum lindemuthianum) was not very important due to the use of western-grown seed and of resistant

varieties, and to dry weather. Five per cent loss was reported from Pennsylvania, 3 per cent in West Virginia, and Georgia, and 2.5 per cent in Colorado. In other States reporting the loss did not exceed 1 per cent.

RUST (Uromyces phaseoli typica /U. appendiculatus/) occurred rather generally but caused little or no loss except in Georgia, where 5 per cent was estimated.

ROOT AND STEM ROTS were reported as causing losses as follows: 7 per cent in North Carolina, 6 in Pennsylvania, 5 in South Carolina and Georgia, 4 in Florida, 3 in West Virginia, 2.5 in Maryland, 2 in Massachusetts, Louisiana, Texas, and Colorado, 1 in Montana, and traces in New York, Minnesota, and Wyoming. Corticium vagum occurred in New York, New Jersey, Georgia, Florida, Louisiana, Michigan, and Washington. Root rot due to Fusarium sp. was reported from Maryland, Virginia, and South Carolina, and dry root rot caused by F. martii phaseoli from Mississippi. Sclerotinia sclerotiorum was less important than usual in New York and was also reported from Texas. Sclerotium rolfsii was reported from Mississippi, Louisiana, and Puerto Rico.

MOSAIC (virus). Losses attributed to bean mosaic in 1934 were considerably less than for the past few years in most of the States reporting. In Illinois 10 per cent loss was estimated, in Colorado 5 per cent on dry beans and 2 on snap beans, in Montana 4, in Massachusetts and Idaho 3, in North Carolina, Minnesota, Texas, North Dakota and Wyoming 2, in West Virginia, South Carolina, and Wisconsin 1, in Pennsylvania, Maryland, and Ohio 0.5, and in New York, Florida, and Michigan, traces. In New York infection of Stringless Green Pod Refugee ranged from 95 to 100 per cent, with a consequent reduction in yield of 15 per cent. Exposed fields suffered less severely than sheltered fields. Mosaic was prevalent on Stringless Refugee in Michigan also and the variety was reported as very susceptible in Maryland. Resistant varieties such as Burpee's Giant, Asgrow, and Full Measure, are generally used in Maryland. The Robust variety mostly grown for field beans in Michigan is very resistant.

CURLY-TOP (virus). A severe outbreak occurred in 1934 in the Pacific Northwest and other regions where curly-top occurs. (P.D.R. 18: 168, 173). A loss of 10 to 20 per cent was estimated in Washington.

OTHER DISEASES. GRAY MOLD ROT (Botrytis cinerea), New York, rare. LEAF SPOT (Cercospora cruenta) was serious on snap beans near Eastman, Georgia. POWDERY MILDEW (Erysiphe polygoni) occurred in the fall crop in Virginia, during the cooler part of the season

in Florida, and was rather common locally in Louisiana. Little damage was caused. ROOT KNOT (Heterodera marioni) was present in Florida, Mississippi, and Arkansas. CHLOROSIS was common in several parts of New Jersey. YELLOWING due to magnesium deficiency was common on beans and other vegetables in Florida. It is generally controlled by spraying with magnesium sulfate. SPRAY BURN was reported from New Jersey. Dust injury due to arsenate of lead was bad on one farm in Connecticut. SUNSCALD was reported from New Jersey.

L I M A B E A N

POD BLIGHT (Diaporthe phaseolorum) was said to be very severe in some plantings in New Jersey and was reported in Connecticut and Maryland. ANTHRACNOSE (Colletotrichum lindemuthianum) caused 2 per cent loss in Ohio. ANTHRACNOSE (C. truncatum) was reported from Mississippi. BACTERIAL BLIGHT (Bacterium phaseoli) was the cause of rot of Fordhook lima beans grown in southern Georgia. In one lot observed in the Athens market 50 per cent were affected. BACTERIAL LEAF SPOT (B. vignae = B. syringae) was reported from Connecticut and Maryland. DOWNY MILDEW (Phytophthora phaseoli): One hundred per cent infection was observed in two large plantings in New Jersey. A loss of 1 per cent was reported from Maryland and 0.1 per cent from Ohio. SCAB (Elsinoe phaseoli) was less abundant in Puerto Rico than in 1933. ROOT ROTS, due to Fusarium spp. and other organisms, caused a loss of 1.5 per cent in Maryland. OEDEMA (non-par.) was reported from Pennsylvania.

S W E E T P O T A T O

BLACK ROT (Ceratostomella fimbriata). Most of the eastern sweet potato growing States reported the usual amount of black rot. In Tennessee, Indiana, Iowa, and Kansas there was less, due to hot dry weather. In Iowa, according to J. J. Wilson, black rot has become a less serious factor because of seed treatment and hot bed sanitation. Two per cent in Iowa was the highest reduction in yield reported. The disease was reported once in Connecticut which is outside the sweet potato growing area.

WILT, STEM ROT (Fusarium batatatis and F. hyperoxysporum). The hot dry weather that reduced the amount of black rot in Tennessee, Indiana, Iowa, and Kansas, favored the development of stem rot in those States and heavy losses resulted. In Indiana, "It was the most conspicuous disease of sweet potatoes. Growers who usually get yields of 200 to 250 bushels per acre, in 1934

obtained yields ranging from 50 to 75 bushels," according to J. A. McClintock. In Kansas, O. H. Elmer reported that "Plants were more generally affected than ever before. In inspections for certification, very few fields were passed, even of growers who usually are granted certification." In Weakley County, Tennessee, field counts made by Paul R. Miller showed an average loss of about 25 per cent, and in some fields it was as high as 65 per cent. Stem rot was prevalent in seed beds and fields in Arkansas. In Delaware there was said to be much more than usual. A considerable amount of replanting was necessary. In most of the other sweet potato growing States the usual amount occurred. Harold T. Cook reported that on the Eastern Shore of Virginia, "Much of the loss was overlooked owing to the luxuriant growth of the living vines during the rainy season." Estimates of loss include 30 per cent in Indiana, 20 in Iowa, 15 in Tennessee, 7 in Virginia and Kansas, 2 in Arkansas, 1.5 in Maryland, 1 in Delaware and Louisiana, and traces in South Carolina and Colorado.

SCURF (Monilochaetes infuscans) was the cause of serious losses in some places in New Jersey. In Virginia it caused a loss estimated at 1 per cent, in Maryland, 0.5 per cent. It was also reported in Connecticut where it had not been observed before, Delaware, Mississippi, and Kansas. In Indiana it was not seen in 1934.

STORAGE ROTS (various organisms) caused losses averaging about as usual.

MOTTLE NECROSIS (Pythium ultimum) was reported from Indiana as less prevalent than usual.

DROUTH INJURY caused very serious reduction in the crop of slips in Arkansas, also death of plants in fields; and severe cracking after rains.

OTHER DISEASES. WHITE RUST (Albugo ipomoeae-panduratae), New Jersey. SOIL ROT (Actinomyces sp.), Delaware, Maryland, Kansas. FOOT ROT (Plenodomus destruens), Maryland. RHIZOCTONIA (R. solani), Kansas. ROOT KNOT (Heterodera marioni), Mississippi. FASCIATION (non-par.), Connecticut, New Jersey. OEDEMA (non-par.), common in New Jersey. MOSAIC (undet.), Florida.

O N I O N

DOWNY MILDEW (Peronospora destructor = P. schleideni). Losses of 1 per cent were estimated in Massachusetts and Pennsylvania. In Pennsylvania the disease was said to be most severe

on perennial onions. It was also reported from New York, New Jersey, and Washington.

SMUT (Urocystis cepulae) caused losses estimated at 6 to 7 per cent in New York, 4 per cent in Massachusetts, and 3 per cent in Ohio, and was also reported from Wisconsin. Davis and Boyd report a tendency of growers in Massachusetts to drop the use of formaldehyde treatment and to overcome the loss in stand by thick planting. In Orange County, New York, the average infection was 10 to 20 per cent, due to heavy spring rains. Some fields showed 60 per cent infection. In Western New York there was less than usual due to the drier season. Smut is generally distributed in onion-growing sections in Ohio but formaldehyde treatment is in almost universal use and keeps losses at the minimum, according to J. D. Wilson.

PINK ROOT reported as due to Phoma terrestris, occurred in New York and Ohio. There was more than usual in New York but the loss was slight as the yields were above normal. Japanese bunching types were reported as immune to the disease. One to 3 per cent loss was estimated in New York and 1 per cent in Ohio.

ROOT ROT, BULB ROT (Fusarium spp.). Root rot caused a loss of 5 per cent in Massachusetts and a trace in Colorado. Bulb rot was reported from Mississippi and on onions in storage in Massachusetts.

PURPLE BLOTCH (Macrosporium porri) caused 2 per cent loss in one large field in Oswego County, New York, and was observed in one or two other fields of late Sweet Spanish onions on new muck land. It was reported in northern Colorado. MOLD (Macrosporium parasiticum), was reported from New York and BLIGHT (Macrosporium sp.) from Washington.

STORAGE ROTS due to Botrytis allii, Penicillium spp., and Fusarium spp. caused a loss of 10 per cent of the stored crop in Massachusetts. NECK ROT (Botrytis allii) damaged a few plantings of sets in Massachusetts. It caused severe losses in storage and transit in Minnesota. A loss of 0.5 per cent of stored onions was estimated in New York. Botrytis sp. was reported as causing neck rot in Wisconsin and blight in New Jersey. BACTERIAL SOFT ROT (Bacillus carotovorus) occurred in New York, sometimes following sunscald, and in New Jersey. BLACK MOLD (Aspergillus niger) and SMUDGE (Colletotrichum circinans) were reported from New York.

OTHER DISEASES. ROOT KNOT (Heterodera marioni) was severe in certain fields in Ohio where a loss of 1 per cent was estimated. MOSAIC (virus) was observed on potato onions in Kentucky. SUN SCALD (non-par.) caused a loss of 1 per cent in New York.

C A B B A G E

YELLOWS (Fusarium conglutinans). Michigan, Wisconsin, Minnesota, and Kansas reported that yellows has increased in prevalence and severity during the past few years. In Michigan it is rapidly becoming and in Kansas has already become the most serious cabbage disease. It was observed in Pennsylvania for the first time in several years. The losses reported were not very high, the greatest being 7 per cent in Maryland, others 2 per cent in Ohio and Michigan, 1 in New York, and traces in Pennsylvania and Virginia. New Jersey and Colorado also reported yellows.

CLUB ROOT (Plasmodiophora brassicae) was reported in its usual range. It was said to be the principal limiting factor on many farms in Massachusetts, where 2 per cent loss was estimated. Other losses reported were 1.5 per cent in Ohio, 0.5 in Maryland, and a trace in Pennsylvania.

BLACK LEG (Phoma lingam). The highest loss estimated was 2 per cent in Maryland. In New York, 1 to 2 per cent loss was reported on Long Island but only a trace up State, where the disease has been almost eliminated due to the stringent use of control measures. Black leg occurred in Massachusetts, New Jersey, Louisiana, and Wisconsin, also.

BLACK ROT (Bacterium campestre) was much more prevalent than usual in eastern Virginia where it caused a loss of 20 per cent. Very wet weather in August and September was believed to be the reason. One case was reported in Louisiana and another in Ohio of severe outbreaks in fields planted with treated seed. The loss in Ohio was estimated at 5 per cent, in New York at 3 to 5 per cent on Long Island and only a trace up State, in Pennsylvania at 2 per cent and in Maryland at 0.5 per cent. The disease was also reported from Massachusetts, New Jersey, Tennessee, where it was very severe in some fields in Cumberland County, Mississippi, Wisconsin, Minnesota, and Puerto Rico.

WIRE-STEM, BOTTOM ROT, Etc. (Corticium vagum). Wire stem was reported from New York, New Jersey, and Kansas. The loss in New York was 2 to 3 per cent. When plants affected even slightly with wire stem were set out, they failed to have large or solid heads. Damping-off was reported from New Jersey, root rot in Georgia, and bottom rot from Florida where it caused a loss of 3 per cent.

HEAD ROT (Rhizoctonia sp.) was reported from Wisconsin.

DOWNY MILDEW (Peronospora parasitica) caused losses of 2 per cent in Virginia and Florida and a trace in New York. In

New York, it occurred to some extent in nearly all fields. It was severe in some fields in New Jersey. In Virginia its appearance was delayed by very dry weather during the growing season and there was much less than usual. Delaware and Mississippi also reported its occurrence.

OTHER DISEASES. BLACK LEAF SPOT (Alternaria brassicae) causes some damage in storage in New York but is more important as a stem canker of seedlings. The loss was estimated at 1 to 3 per cent. In Ohio 0.5 per cent loss was reported. The disease occurred in Connecticut, New Jersey, Mississippi, and Wisconsin also. LEAF SPOT (Cercospora blosxami), New Jersey. PEPPERY LEAF SPOT (Bacterium maculicolum) was reported from New York where it is said to be rare. BACTERIAL SOFT ROT (Bacillus carotovorus) was very severe in Norfolk and Nansemond Counties in Virginia. The reduction in yield was said to be 20 per cent and an additional 20 per cent loss was due to storage rot. WATERY SOFT ROT (Sclerotinia sclerotiorum) caused some loss in field and storage in New York. OEDEMA (non-par.) was reported from New York and New Jersey. BLACK SPECK due to suboxidation was reported from Washington. TIP BURN (non-par.) caused loss ranging from a trace to 2 per cent in New York. The Danish Ball Head variety is very susceptible.

C A U L I F L O W E R

CLUB ROOT (Plasmodiophora brassicae). Losses reported were 3 to 5 per cent in New York and 2 per cent in Massachusetts. In New York 100 per cent infestation was observed in several fields but there was no apparent injury to the heads. In Massachusetts, dry weather weakened plants and made them less able to withstand the attack of the organism. New Jersey and Washington also reported club root.

BLACK ROT (Bacterium campestre) was reported on cauliflower from Massachusetts, New York, New Jersey, and Louisiana. In Massachusetts it became severe in September after rains began and caused heavy spotting of heads before and following harvest in scattered, late-planted fields. The loss was 5 per cent. In New York the disease is rather serious on Long Island, where 5 per cent loss was estimated. Only a trace occurred elsewhere in the State.

OTHER DISEASES. BLACK LEAF SPOT (Alternaria brassicae), New York, New Jersey. PEPPERY LEAF SPOT (Bacterium maculicolum), Massachusetts, New York. DOWNY MILDEW (Peronospora parasitica), New York. WIRE STEM (Corticium vagum), caused 1 to 3 per cent loss in New York. DAMPING OFF due to this organism was reported

from New Jersey. BLACK LEG (Phoma lingam), Massachusetts, New York. YELLOWS (Fusarium conglutinans), Wisconsin. BACTERIAL SOFT ROT (Bacillus carotovorus) was prevalent in Delaware County, New York, following hot weather injury. The loss was estimated at 0.5 to 1 per cent. It was also reported from Massachusetts. WATERY SOFT ROT (Sclerotinia sclerotiorum), trace to 0.5 per cent in New York. WHIPTAIL AND BROWN ROT (non-par.) caused a loss of 26,000 crates in Delaware County, New York, but the loss for the State was a trace.

B R O C C O L I

LEAF SPOT (Alternaria sp.) was reported from Louisiana. BLACKLEG (Phoma lingam) caused a loss of 5 per cent on Long Island, and was reported from New Jersey. BLACK ROT (Bacterium campestre) was favored by the wet weather of August and September and caused a 20 per cent loss in eastern Virginia. It was also reported from Wisconsin.

B R U S S E L S S P R O U T S

BLACK LEG (Phoma lingam) was very severe in some cases in New Jersey.

C O L L A R D S A N D K A L E

LEAF SPOT (Alternaria sp.), Louisiana, on collards. BLACK ROT (Bacterium campestre) on kale was reported from New Jersey and caused 20 per cent loss in eastern Virginia. CLUB ROOT (Plasmiodiophora brassicae), New Jersey, unimportant.

H O R S E R A D I S H

WHITE RUST (Albugo candida), was nearly absent from greenhouse crops in New York in the winter due to cold and low humidity. In two fields 20 per cent infection was observed but losses were slight. It was also reported from New Jersey and caused 1 per cent loss in Ohio.

OTHER DISEASES. BACTERIAL SOFT ROT (Bacillus carotovorus) was general and caused severe losses in Nassau County, New York. ROOT ROT (Fusarium sp.) was isolated from roots of diseased plants in New Jersey. LEAF SPOT (Ramularia armoraciae), New York. FASCIATION (non-par.), New Jersey.

K O H L R A B I

CLUB ROOT (Plasmodiophora brassicae). One hundred per cent infestation was observed in one field in Nassau County, New York.

R A D I S H

SCAB (Actinomyces scabies), Wisconsin. WHITE RUST (Albugo candida), New York, New Jersey, Pennsylvania, and Wisconsin. BACTERIAL SOFT ROT (Bacillus sp.), New Jersey. DOWNY MILDEW (Peronospora parasitica) was prevalent in fields in New York but did not cause much loss. It was absent from the greenhouse crop in the winter due to cold and consequent low humidity. BLACK ROOT (Pythium aphanidermatum), Massachusetts, Mississippi, Wisconsin. CLUB ROOT (Plasmodiophora brassicae) was rather severe in some fields in New York.

R U T A B A G A

SCAB (Actinomyces scabies), New Jersey. DARK CENTER (non-par.) caused a loss of 10 per cent in Massachusetts. On Cape Cod, and in the western hill towns, entire fields or parts of fields were not dug due to this discoloration inside the roots. MOSAIC (virus), Connecticut.

T U R N I P

GRAY LEAF SPOT (Alternaria herculea) was reported from New York where it is not often present. BACTERIAL SOFT ROT (Bacillus carotovorus), Mississippi. LEAF SPOT (Bacterium sp.), was observed to be severe in one small field near Athens, Georgia. BLACK ROT (Bacterium campestre) caused losses ranging from light to 75 per cent in some places in Massachusetts, and was also reported from Mississippi. ANTHRACNOSE (Colletotrichum higginsianum), Mississippi. DOWNY MILDEW (Peronospora parasitica), New Jersey. MOSAIC (virus), Mississippi.

W A T E R C R E S S

BLIGHT, of undetermined cause, was reported from Washington.

C A N T A L O U P E

BACTERIAL WILT (Bacillus tracheiphilus) caused losses estimated at 10 per cent in Massachusetts, 5 in Ohio, 3 to 5 in New York, and 2 in Maryland and Iowa. The crop was planted much later than usual in Iowa, which accounts for the small loss in spite of favorable weather for the disease and a mild winter favoring survival of the striped cucumber beetle. Connecticut, New Jersey, and Minnesota also reported its presence. None was observed in Kansas.

WILT (Fusarium sp.) In New York, this wilt is mostly confined to the Lake Shore area of Monroe County, where approximately 50 per cent of the crop was killed. On one farm in Niagara County there was 80 per cent loss, on another 5 per cent. In Minnesota, Fusarium wilt is very destructive in the infested areas in Hennepin and Ramsey Counties, but it is not yet widespread. The hot, dry weather favored its attack this year and plants were destroyed in the early seedling stage. Fusarium wilt was also reported from West Virginia.

GUMMY STEM BLIGHT (Mycosphaerella citrullina) is becoming one of the serious problems in melon growing in New York, especially in the northwestern part of the State, according to Charles Chupp. The loss was estimated at 5 to 10 per cent. In a field in Monmouth County, New Jersey, the plants were completely killed in a space of 50 to 75 feet.

ANTHRACNOSE (Colletotrichum lagenarium). In Massachusetts, Boyd reported that anthracnose made pronounced headway on many farms in the latter part of August and September, in spite of the dry August weather. It caused severe fruit spotting in September and early October. The loss in Massachusetts was 3 per cent, in New York and Maryland about 0.5 per cent. In Minnesota it appeared too late to cause much damage; in Kansas very little anthracnose was seen. Other States reporting its occurrence were Connecticut, New Jersey, Tennessee, and Wisconsin.

LEAF BLIGHT (Macrosporium cucumerinum) apparently developed too late to be very important except locally. Iowa reported 10 per cent loss, Massachusetts 4, Ohio, 2, and New York a trace.

MOSAIC (virus) caused losses estimated at 4 to 5 per cent in New York and 0.5 per cent in Maryland, and was reported from New Jersey, Wisconsin, Minnesota, and Kansas. **CURLY-TOP** (virus) was destructive in the Pacific Northwest and in Idaho (P. D. R. 18: 168, 173).

OTHER DISEASES. **SCAB** (Cladosporium cucumerinum) caused a trace of loss in Massachusetts. **POWDERY MILDEW** (Erysiphe polygoni),

New Jersey, Georgia. DOWNY MILDEW (Pseudoperonospora cubensis) was mostly reported as less prevalent than usual. Losses estimated were 1 per cent in Ohio, 0.5 in Massachusetts and Maryland. It also occurred in Connecticut, Delaware, Georgia, and Wisconsin. STEM ROT (Sclerotium rolfsii), Arkansas. LEAF SPOT (Septoria cucurbitacearum), reported from New York as rare.

NON-PARASITIC. Injury due to mineral deficiency and dry weather was very prevalent in Albany, Schenectady, and especially in Niagara Counties in New York. In some fields in Niagara County injury ranged from none to 100 per cent. In Ohio heat injury during one week of 107° temperatures in July caused a loss of 30 per cent. It destroyed all early planted melons.

C U C U M B E R

BACTERIAL WILT (Bacillus tracheiphilus) was generally said to be an important disease in the States reporting it. Losses estimated were 20 per cent in Massachusetts, 7 to 10 in New York, and 5 in Pennsylvania and Ohio. It was also reported from Connecticut, New Jersey, Delaware, and Wisconsin, and from Puerto Rico where it was said to be rare.

GUMMY STEM BLIGHT (Mycosphaerella citrullina) was more prevalent than usual or than last year in New York. It is becoming so serious that the cucurbit-growing industry of New York is threatened, according to Charles Chupp, and no control measures are available as yet. The loss was estimated at 10 per cent, with 20 per cent in some cases. The disease was not severe on cucumber in New Jersey.

DOWNY MILDEW (Pseudoperonospora cubensis) appeared late in most of the States reporting it. In Massachusetts it caused losses only in the latest plantings. S. P. Doolittle reported that downy mildew was severe at Beltsville, Maryland. In Ohio, the cool, wet September favored the spread of the disease near the end of the picking season. In Wisconsin it occurs only in greenhouses. In Puerto Rico downy mildew was said to be the most important disease of cucumbers. Losses reported were 10 per cent in Florida, where the disease is found throughout the year, 1 per cent in Massachusetts and Pennsylvania, 0.5 per cent in Ohio. Downy mildew was not observed in New York in 1934.

MOSAIC (virus) appears to be increasing in importance in field plantings outside the greenhouse area in Massachusetts, according to Boyd. It was very destructive in many crops late in the season. The total loss was estimated at 2 per cent. In New York it caused a loss of 15 to 20 per cent. In one field in Niagara County, 50 per cent loss occurred. In New Jersey, it was general

but not severe. In Ohio, it was severe in certain fields, but was generally of slight importance. The loss was 2 per cent. It was not so severe as usual in Kansas. Mosaic was observed in a garden in Montana, apparently for the first time in the State. The total loss in Maryland was 4 per cent of which 2 per cent was reduction in yield. Mosaic was also reported from North Dakota and Wisconsin, and from Puerto Rico where it was said to be rare.

CURLY-TOP (virus) caused heavy losses in the Northwest (P.D.R. 18: 168, 173).

OTHER DISEASES. ANGULAR LEAF SPOT (Bacterium lachrymans) was reported from Massachusetts, New York, and Wisconsin. SCAB (Cladosporium cucumerinum) was common in July and August in Massachusetts but did little damage until the rainy weather of September. Massachusetts and Pennsylvania report good control by spraying. Losses reported were 2 per cent in Pennsylvania, 1.5 in Massachusetts, and a trace in New York. The disease occurred in Wisconsin also. ANTHRACNOSE (Colletotrichum lagenarium) caused little loss. One per cent was estimated in Pennsylvania and Ohio, and 0.5 per cent in Maryland. New Jersey and Wisconsin also reported its presence. POWDERY MILDEW (Erysiphe polygoni) Washington, Puerto Rico. LEAF BLIGHT (Macrosporium cucumerinum), 2 per cent loss in Maryland, a trace in New York, also reported from West Virginia, Tennessee, and Wisconsin. DAMPING-OFF (Pythium sp.), New Jersey. Damping-off, cause not mentioned, caused 25 per cent loss in Pennsylvania. FRUIT-ROT (Pythium sp.) was reported from Puerto Rico as important in rainy weather and in fields that have been in cucumbers previously. WILT, TIMBER ROT (Sclerotinia sclerotiorum) New York, Washington.

P U M P K I N

BACTERIAL WILT (Bacillus tracheiphilus) was general in New York where it caused a loss of 1 to 3 per cent. POWDERY MILDEW (Erysiphe cichoracearum) was general but caused only a trace of loss in New York; common in New Jersey and very severe in some fields; reported from Georgia. WILT (Mycosphaerella citrullina) was observed in one field on Staten Island, New York and seemed to be rather superficial on the fruit. The loss in the field was about 5 per cent. MOSAIC (virus), New Jersey.

S Q U A S H

BACTERIAL WILT (Bacillus tracheiphilus) was general on both summer and winter squash in Massachusetts. The loss was 10 per cent. In New York also it was general and caused severe loss in several

fields. The loss for the State was 1 to 3 per cent. Bacterial wilt was also reported from New Jersey.

STORAGE DISEASES. In Massachusetts Fusarium spp., Penicillium spp., Rhizopus spp., Cladosporium cucumerinum, and bacteria caused 35 per cent loss to the stored crop, which is not more than one-third of the entire crop. Mycosphaerella and Cladosporium were less prevalent and the other organisms more damaging than usual.

MOSAIC (virus) caused a loss of 2 per cent in Massachusetts. Heavy losses occurred in some fields of summer squash, very little in others. Less damage was done to winter than to summer squash. A loss of 1 to 2 per cent was estimated in New York. The disease was also reported in Connecticut. F. L. Wellman reported that "Mosaic (celery virus 1) was severe in some fields in Southern Florida, on the East Coast and around Sanford. Circumstances had a great deal to do with severity of the trouble. I saw fields that had only a few infected plants along edges next to weed hosts; fields in which all plants were diseased, but about 50 per cent of the crop was harvested, and other fields which produced absolutely nothing and were plowed under." CURLY TOP (virus) was severe in the Northwest (P.D.R. 18: 168, 173).

OTHER DISEASES. BACTERIAL LEAF SPOT (Bacterium cucurbitae) was reported as not a common disease in New York and less prevalent than usual in 1934. SCAB (Cladosporium cucumerinum) was less important than usual in Massachusetts, due to dry weather in July and August, although it was surprisingly prevalent in some fields of summer squash as early as late July. It was most damaging to late plantings of summer squash and caused very little loss in winter squash. The loss was estimated at 1 per cent. POWDERY MILDEW (Erysiphe cichoracearum), Connecticut; always very common in New York when the plants are nearly mature; general in New Jersey, very severe in several fields in Middlesex County; Georgia and Washington. LEAF BLIGHT (Macrosporium cucumerinum), New York. GUMMY STEM BLIGHT, BLACK ROT (Mycosphaerella citrullina) was less destructive both on vines and on fruit in storage in Massachusetts, due to dry weather in July and August. The loss was 5 per cent. DOWNY MILDEW (Pseudoperonospora cubensis) was not reported on squash in 1934.

W A T E R M E L O N

BACTERIAL WILT (Bacillus tracheiphilus) caused 5 per cent loss in Maryland, and was reported from New Jersey.

WILT (Fusarium nivium) was reported from Virginia, Georgia, Florida, Mississippi, Minnesota, Iowa, Kansas, and Washington. Marion Walker in Florida reported that "The greatest loss from

this disease is an indirect one occasioned by the necessity of seeking virgin soil each year." In Minnesota it was found for the first time at Winona and in Hennepin County near Minneapolis. The use of resistant varieties such as Iowa Belle, Iowa King, and Pride of Muscatine has reduced its importance in Iowa, where the loss was estimated at 5 per cent.

ANTHRACNOSE (Colletotrichum lagenarium) was less prevalent than usual in New Jersey, Maryland, and Kansas, more prevalent in Pennsylvania, Delaware, Florida, and Minnesota, and of average importance in other States reporting it. In Florida its development was favored by heavy precipitation during the period following setting of the fruit. It caused 25 per cent reduction in yield and 5 per cent loss from fruit spotting. In Minnesota, infection developed only after late rains when the peak of the harvest was already past, and although heavier than usual did not cause much damage. The loss in yield in Iowa was said to be 12 per cent. In Maryland, the reduction in yield was only 0.5 per cent but loss from fruit spotting was 6.5 per cent. Ohio reported 2 per cent reduction in yield.

OTHER DISEASES. GUMMY STEM BLIGHT (Mycosphaerella citrullina) was much more prevalent in Florida due to heavy rainfall during April and May. The loss was estimated at 5 to 10 per cent. DOWNY MILDEW (Pseudoperonospora cubensis) was also much more prevalent than usual in Florida, and Walker reported that this was the first time he had observed it to cause serious damage to watermelons. Downy mildew was also reported from Mississippi.

C E L E R Y

EARLY BLIGHT (Cercospora apii). Less than usual was reported from Massachusetts, New York on muck soil, New Jersey, and Wisconsin, more in Pennsylvania and Michigan, and the usual amount elsewhere in New York, and in Florida and Ohio. In Pennsylvania, the disease was most severe near Philadelphia. In Michigan, due to severe drought and lack of heavy dews and fogs, the disease was of comparatively minor importance in 1934, after the heavy losses that it caused during the three preceding seasons. Losses reported as due to early blight were 15 per cent in Pennsylvania, 5 in Florida, 4 in Massachusetts, 2 in Ohio, trace to 1 per cent in New York, and a trace in Michigan.

LATE BLIGHT (Septoria spp.) became destructive to many late plantings in Massachusetts during October. Earlier it had been held in check by dry weather. In western New York, there was less than usual due to drought, elsewhere in the State, and in New Jersey,

Pennsylvania, and Ohio more was reported. Late blight was very severe in some plantings in New Jersey, especially in the north. In Pennsylvania it occurred wherever celery was grown but was most severe outside of the Philadelphia area. Cool weather and excessive rains in late fall favored the development of the disease in Ohio. Michigan, Wisconsin, and Colorado reported less than usual, due to dry, hot weather. North Dakota and Washington also reported late blight. Losses were estimated at 20 per cent reduction in yield and 5 per cent loss in grade in Pennsylvania, 5 per cent in Ohio, 4 in Massachusetts, 2 to 3 in New York, and traces in Michigan, North Dakota and Colorado.

YELLOW (Fusarium sp.) is now known to occur on eighteen farms in Wayne and Monroe Counties, New York. More than usual was reported from Pennsylvania, Ohio, and Michigan, and the usual amount from Wisconsin and Colorado. In Ohio yellows was very severe in certain fields and indications are that growers will be compelled to use resistant strains. A more general use of Michigan State College resistant varieties prevented very heavy losses in the Kalamazoo area. The new "Michigan Golden" variety proved highly satisfactory in 1934 in Michigan, and in New York and Colorado as well. Losses reported were 10 per cent in Colorado, 8 in Michigan, 3 in Ohio, and a trace in Pennsylvania.

ROOT KNOT (*Heterodera marioni*) is becoming increasingly prevalent in Ohio celery fields especially on muck lands. In Michigan, severe cold weather did not kill out the nematode in muck soils. The disease reappeared in fields where it caused damage in 1933 but much less seriously. Losses reported were 2 per cent in Ohio and a trace in Michigan.

BLACK HEART (non-par.) was reported from New Hampshire and New York. In New York it was said to be worse than usual due to wet weather in the spring followed by a hot dry summer. The newer strains of Golden Self Blanching are susceptible. A report on the distribution, etc. of blackheart was given in P. D. R. 18: 177-185. CRACK STEM (non-par., cause unknown) was reported from New Hampshire, Connecticut, Florida, Michigan, and Washington. In Connecticut the trouble was ascribed to variable wet and dry weather and had not been observed previously. In Florida, according to F. L. Wellman, "This trouble was severe again in the spring of 1934. It has been severe for the last four seasons at least, and caused much damage each year. Losses expressed on a percentage basis have not been attempted. One large grower lost over 20 per cent of his crop in a twenty-acre block of celery, and another grower lost around 12 per cent in a forty-acre block." In Michigan it is an important disease where conditions favor it. It usually occurs in highly alkaline soils but occasionally in acid soils. Soil deficiency was

said to be the cause in Washington. DROUGHT AND HEAT INJURY to celery was severe in Michigan. Heavy losses occurred in seed beds where the stands were poor and the young plants were injured by high soil temperatures.

MOSAIC (virus), Connecticut, New York, California.

SOUTHERN CELERY MOSAIC (celery virus 1): This virus disease was extremely troublesome in Florida in the winter of 1933-34, and caused very severe losses in many fields in the late spring of 1934. This was especially keenly felt by growers because of the relatively narrow margin of profit experienced by them at harvest time. In the Sanford region, losses over the district as a whole must have been close to 5 per cent. Some growers were forced to abandon certain of their fields completely. Others threw out large quantities of the crop at harvest time. (F. L. Wellman)

OTHER DISEASES. Several diseases were reported from New York. BACTERIAL SOFT ROT (Bacillus carotovorus) caused a trace of loss in the field and 2 to 3 per cent in storage. Six per cent loss was observed on one forty-acre field on muck soil in Wayne County growing its first crop. It was absent on lettuce in the same field. GRAY MOLD ROT (Botrytis cinerea), ROOT ROTS (Corticium vagum, Phoma apicola), BACTERIAL BLIGHT (Phytophthora apii) caused traces of loss. WATERY SOFT ROT (Sclerotinia sclerotiorum) caused 5 to 10 per cent loss in storage, and a trace in the field. It was also reported from Colorado.

L E T T U C E

BOTTOM ROT (Corticium vagum). Many fall crops in Massachusetts were badly damaged after the September rains began. The disease was not uncommon in the early summer crop also. In up State New York it caused almost no trouble most of the summer due to the very dry condition of the muck soil. The loss in Massachusetts was estimated at 4 per cent, in New York at a trace to 1 per cent. The disease was also reported from Mississippi. Damping-off due to Rhizoctonia sp. was very severe on Romaine lettuce in New Jersey. One brand of formaldehyde dust used at the rate of one ounce to the square foot gave no appreciable control.

DROP (Sclerotinia spp., mostly reported as S. sclerotiorum). In Massachusetts, this was the most common cause of injury in greenhouse crops and coldframes, in field crops it was less important than bottom rot. The loss was said to be 1 per cent. In New York drop caused 2 to 4 per cent loss in greenhouses and a trace to 2 per cent in fields. Ten to 20 per cent was observed in several fields in Nassau County.

A loss of 10 per cent was reported from Florida, 1 per cent in Ohio, and a trace in Pennsylvania. Sclerotinia minor was very severe in some fields in New Jersey.

YELLOW (rabbit-ear or white heart; due to virus). The loss in a few fields in New York reached 70 to 80 per cent. For the State it was estimated at 5 per cent. In Ohio it appeared in rather severe form in some fields, causing a loss averaging 0.5 per cent. MOSAIC (virus) was present in almost every field in New York. The loss was estimated at 0.5 per cent.

TIPBURN (non-par.) caused a loss of 5 to 7 per cent in New York where there was less than usual; and was also reported from New Jersey and Wisconsin.

OTHER DISEASES. GRAY MOLD ROT (Botrytis cinerea) New York, New Jersey. DOWNY MILDEW (Bremia lactucae), Massachusetts, New York, New Jersey. In up-State New York there was less than usual due to the dry season, but one rather severe outbreak in September followed a period of cool weather in August. DAMPING-OFF (Pythium sp.) New Jersey. LEAF SPOT (Septoria lactucae), New York, rare.

P E A S

A report on the occurrence of bean and pea diseases in some of the western States in 1934, by L. L. Harter and W. J. Zaumeyer, was published in the Reporter (19: 142-144).

BACTERIAL BLIGHT (Bacterium pisi) caused losses estimated at 3 per cent in Colorado, 0.2 per cent in Maryland, and a trace in New York, and was reported from Wisconsin.

ROOT AND STEM ROTS. Losses from root rots in general will be reported in the Crop Loss Estimate Supplement 89. Commercial production of peas in Massachusetts is made unprofitable by losses from disease, and very heavy losses occur in home gardens. Aphanomyces euteiches was reported from Massachusetts, New York, New Jersey, Maryland, and Wisconsin mostly as less important than usual. The loss in Maryland was estimated at 3.5 per cent. Corticium vagum was reported from New York, where it caused about 0.5 per cent loss; New Jersey; Florida, where it was most severe on early fall plantings on poorly prepared land; and Washington. Fusarium martii pisi occurred in Virginia, Ohio, where the loss was 1 per cent, Wisconsin, and Colorado. Fusarium sp. was reported from Washington.

FUSARIUM WILT. Fusarium orthoceras pisi was reported from Maryland and Wisconsin. The use of resistant strains is reducing losses in both States. The loss in Maryland was 0.5 per cent.

Wilt due to Fusarium spp. was said not to be common in New York and was reported from New Jersey. "Near wilt" caused by Fusarium sp. was reported from Washington.

BLIGHT, POD SPOT, AND FOOT ROT (Ascochyta spp. and Mycosphaerella pinodes). Ascochyta blight was of unusual importance in the Santa Maria district in California in the spring. Ascochyta pisi caused 3 per cent loss in the San Luis Valley of Colorado. Mycosphaerella pinodes was much less prevalent than usual in Wisconsin. Ascochyta and Mycosphaerella were reported as less prevalent than usual in Maryland and much less so in New York.

RUST (Uromyces fabae). What was apparently the first report of rust on peas in New England was made by O. C. Boyd from Massachusetts in July, 1934. A light scattered infection occurred in one field. In August 1935 Florence L. Markin reported that during the summer of 1934 it had been observed to be abundant at several places in Maine. (P. D. R. 18: 124; 19: 226).

MOSAIC (virus) was very abundant in several plantings in New Jersey and was reported from Washington and New York. STREAK was reported from Washington.

OTHER DISEASES. POD-SPOT due to Botrytis cinerea and bacteria, and BLACK POD SPOT, cause undetermined, were reported from Washington. WHITE MOLD (Cladosporium album), New Jersey. POD SPOT (Cladosporium pisicolum), Oregon, not important. ANTHRACNOSE (Colletotrichum pisi), Wisconsin. POWDERY MILDEW (Erysiphe polygoni), New York, Wisconsin, Washington. DOWNY MILDEW (Peronospora pisi), rare in New York, reported from Wisconsin and Washington. BLOTCH (Septoria pisi), Wisconsin.

DROUGHT INJURY caused heavy loss to the early crop in Wisconsin. In the central section it was hardly worth cutting. Hot winds caused excessive damage in the blossom stage.

A S P A R A G U S

STEM ROT, WILT (Fusarium sp.) was reported from Massachusetts, New York, and New Jersey. In Massachusetts it caused a loss estimated at 5 per cent. RUST (Puccinia asparagi) caused losses estimated at 2 per cent in Massachusetts and 1.5 per cent in Maryland and was reported also from New Jersey, Wisconsin, North Dakota, and Colorado. There was more than usual in Massachusetts, according to O. C. Boyd, who stated that varieties reported to belong to the resistant Washington group were severely damaged in a number of beds. TIP WILT (Alternaria sp. and Botrytis cinerea) was reported from Massachusetts. STEM BLIGHT (Cercospora caulicola)

was severe in one field in Georgia but occurred too late to cause damage to the plants. FASCIATION (non-par.) occurred in Connecticut and New Jersey.

B E E T

SCAB (Actinomyces scabies) caused a loss of a trace to 2 per cent in New York. One field was observed with 90 per cent infection. It was also reported from New Jersey and Wisconsin. LEAF SPOT (Alternaria sp.), New Jersey. LEAF SPOT (Cercospora beticola), generally reported but caused little damage. One per cent loss was estimated in Ohio. ROOT KNOT (Heterodera marioni), Mississippi. DAMPING-OFF (Pythium sp., Rhizoctonia sp., etc.) is the cause of severe losses in stand in home gardens and moderate to heavy losses in commercial plantings in Massachusetts, where a loss of 10 per cent was estimated. Marked control is obtained by seed treatment with red copper oxide. Damping-off caused loss averaging 10 per cent in Nassau County, Long Island. Many hundred pounds of seed were treated with red copper oxide in New York. New Jersey also reported damping-off. CURLY-TOP (virus) was severe in the Pacific Northwest (P.D.R. 18: 168).

C A R R O T

LEAF BLIGHT (Macrosporium carotae) was destructive to fall crops in the Connecticut Valley and other scattered localities in Massachusetts, where lack of crop rotation favors the disease. It was rather prevalent in New York and caused total loss in some fields in Nassau County. In New Jersey it was very severe in some fields in Middlesex County. Losses estimated as due to this disease were 10 per cent in Pennsylvania, 8 in Florida, 5 in Massachusetts, 1 to 2 in New York. Together with Cercospora it caused 1 per cent loss in Ohio.

LEAF BLIGHT (Cercospora apii carotae) was reported from Massachusetts as "destructive in many towns in the eastern part of the State where leaf troubles are rarely of any importance; just why, not known. It caused severe damage in June and July, let up in August, and became active again in the fall." The loss was said to be 5 per cent. The disease was not severe in New York or Ohio.

DAMPING-OFF (various organisms) caused a loss of 5 per cent in Massachusetts. Most of the injury occurs before the seedlings emerge. Seed treatment with red oxide of copper or organic mercury controls it.

YELLOW (virus) was prevalent in New York on Long Island and on muck soils. The loss was a trace to 1 per cent.

OTHER DISEASES. BLACK ROT (Alternaria radicina), New York. BACTERIAL SOFT ROT (Bacillus carotovorus), New York, New Jersey. ROT (Corticium vagum), New York, New Jersey. Decay caused by the Corticium stage was reported by G. B. Ramsey on carrots from New York. (P.D.R. 13: 40). ROOT-KNOT (Heterodera marioni) was less abundant than usual in muck soils in New York, due to the cold winter. It was also reported from Georgia. WATERY SOFT ROT (Sclerotinia sclerotiorum), on carrots in storage in Massachusetts and New York. The loss in Massachusetts was 5 per cent.

E G G P L A N T

FRUIT ROT AND BLIGHT (Phomopsis vexans) was reported from New York where it was unimportant; New Jersey where it was severe in some plantings; Mississippi; and Ohio where the loss was estimated at 4 per cent.

WILT (Verticillium sp.). In Massachusetts it is very difficult to grow a profitable crop on old market garden land due to this wilt. It caused a loss of 20 per cent in Massachusetts. In New York it kills a large part of the crop every year. It was also reported from New Jersey and from Ohio where it caused a loss of 10 per cent.

MOSAIC (virus), New Jersey. CURLY TOP (virus), Pacific Northwest (P. D. R. 18: 168).

LEAF SPOT (Alternaria solani), Massachusetts, New York, not important.

L E E K

PINK ROOT (Phoma terrestris) was reported from one locality in New York.

P A R S L E Y

LEAF SPOTS (Alternaria sp. and Septoria petroselini) were reported in New Jersey.

P A R S N I P

LEAF BLIGHT (Cercospora pastinacae), New York, New Jersey. LEAF BLIGHT (Ramularia pastinacae) was general and severe in

Massachusetts, also reported from New York and Ohio. ROOT CANKERS, due to various soil fungi, caused severe losses in a number of fields in Nassau County, New York. RUSSETING, thought to be due to some soil condition, Washington.

P E P P E R

LEAF SPOT, FRUIT SPOT (Alternaria sp.) was reported from New York (as A. solani), New Jersey, Ohio, and Colorado. A loss of 3 per cent was reported in Ohio, and a trace to 0.5 per cent on Long Island.

ANTHRACNOSE was reported from Louisiana. Both Colletotrichum nigrum and Glomerella cingulata occurred on the Bell and Cheyenne varieties and the former organism was found on one pod of Tabasco pepper.

DAMPING-OFF (Pythium sp., Rhizoctonia sp.) was very destructive in seed-beds, both flats in greenhouses and hot-beds, on many farms in Massachusetts where control measures were not observed. It was well controlled by formaldehyde dust on seed-bed soil. Cuprous oxide seed treatment was less effective. The loss was estimated at 15 per cent of the seedlings. Rhizoctonia sp. caused damping-off and stem rot in New Jersey.

MOSAIC (virus) was reported from Massachusetts, Connecticut, New York, New Jersey, Virginia, and Colorado. One case in which the disease appeared to be seed-borne was observed in Virginia. In Massachusetts a loss of 2 per cent was reported, in New York, 0.5 per cent. In New Jersey both the common pepper mosaic and tobacco mosaic were reported on pepper. The tobacco mosaic caused conspicuous blotching of the pods and some defoliation, but no leaf blotching.

CURLY-TOP (virus), Pacific Northwest (P.D.R. 18: 168).

GRAY MOLD (Botrytis cinerea), New Jersey. FRUIT ROT (Phoma destructiva), Mississippi. WILT (Phytophthora capsici) caused a loss of 0.5 per cent in Ohio, and was reported to occur in Colorado in the Arkansas Valley and the northern part of the State. STEM ROT (Sclerotium rolfsii), local on Bell pepper in Georgia. ROOT-KNOT (Heterodera marioni), Mississippi. ROOT ROT (undet.) of Tabasco pepper was reported from Louisiana. The entire plant wilted but there were no symptoms of any vascular organisms. The roots showed severe rotting.

NON-PARASITIC. BLOSSOM-END ROT caused a loss of 0.5 to 1 per cent in New York and was reported from Mississippi. LEAF ROLL occurred wherever peppers were grown in New Jersey. LIGHTNING INJURY

New Jersey. SUNSCALD was general in New York, where it caused a loss of 0.5 to 2 per cent, and occurred in New Jersey and Mississippi.

R H U B A R B

CROWN ROT. Phytophthora parasitica rhei was found during December in a forcing greenhouse at Canastota, Madison County, New York. The roots apparently had been brought from the central States, and the temperature kept too high in the greenhouse. (C. Chupp). Phytophthora sp. was reported from Arkansas and Ohio. In Arkansas it is very destructive and is the limiting factor in rhubarb culture.

LEAF SPOT (Ascochyta rhei) was reported once in Connecticut. BACTERIAL ROOT ROT occurred in New Jersey. LEAF SPOT (Phyllosticta straminella) was very common in all plantings in New York but was not important. In Nassau County 50 to 60 per cent infection occurred but losses were slight. There was less than usual, due to dry weather, in Ohio, and no loss resulted from it. RED LEAF (virus), Washington.

S A L S I F Y

WHITE RUST (Albugo tragopogonis) was general in New York where it caused a loss of a trace to 2 per cent. It was very severe in one field in Nassau County. It was also reported in Wisconsin. LEAF SPOT (Sporodesmium scorzonerae) was not found in New York although in 1933 it was abundant in one field on Staten Island. YELLOWS (virus) was seen to a slight extent in every planting in Richmond County, Staten Island, New York.

S P I N A C H

DOWNY MILDEW (Peronospora effusa) was of little importance in Massachusetts even after wet weather began in September. The loss was said to be 1 per cent. In New York a loss of 1 to 3 per cent occurred on Long Island, but there was only a trace elsewhere. Pennsylvania reported 1 per cent loss, Maryland 0.5 per cent. In Eastern Virginia a total loss of 10 per cent was reported of which 5 per cent was reduction in yield. The loss was confined to the spring crop. Dry weather in October and November prevented the appearance of downy mildew until two months later than usual and losses in the fall crop were negligible. The source of inoculum of much of the downy mildew on the spring crop in the Norfolk region has been shown to be systemically infected plants that live through the winter. It was thought this year that the severe winter would have killed out most of these plants but this did not prove to be the case. In Arkansas, the disease was prevalent and destructive during late fall and winter.

A loss of 0.5 per cent was reported from Ohio.

DAMPING-OFF (various fungi) was very important in Massachusetts and Pennsylvania and moderately so in eastern Virginia, and Ohio. In Massachusetts, it was prevalent in both home gardens and commercial fields. Good control was obtained in both spring and fall sowings with cuprous oxide seed treatment. In Virginia, where the cause was reported as Pythium sp., seed treatment practically eliminated losses. Most of the damage occurred early in the season when the abundant moisture and warm temperatures were favorable. The cold dry weather of October prevented its development. Losses reported were 20 per cent in Pennsylvania, 10 in Massachusetts, 5 in Ohio, and 2 in Virginia.

LEAF SPOT (Cercospora beticola) was reported from New York as not common. ANTHRACNOSE (Colletotrichum spinaciae) was reported for the first time from Mississippi. A severe outbreak occurred in the vicinity of Laurel. CHLOROSIS due to manganese deficiency, New Jersey. YELLOWING, apparently due to unfavorable growing conditions, was more severe than usual on the fall crop in Massachusetts. YELLOWS or MOSAIC (virus), New York and Maryland.

S W I S S C H A R D

LEAF SPOT (Cercospora beticola) occurred in scattered localities in New York. The loss in one field was 50 per cent, but generally there was only a trace. It was also reported from New Jersey and Georgia. ROOT ROT (Sclerotinia sp.), Mississippi. CURLY TOP (virus) Pacific Northwest (P.D.R. 18: 168).

D I S E A S E S O F S P E C I A L C R O P S

T O B A C C O

A summary of tobacco diseases in 1934 in some of the Atlantic Coast States is given in the Reporter, Vol. 18: 154 - 155.

DOWNY MILDEW (Peronospora tabacina Adam) was reported from Pennsylvania, Maryland, Virginia, North Carolina, South Carolina, Georgia, and Florida. A grower from central Tennessee reported a disease on his tobacco plants which, from his description, appeared to be downy mildew, but no definite record of its presence was received. The disease was not observed in Kentucky, and is believed never to have appeared there. Under date of February 13, 1935, Dr. Frederick A. Wolf requested that a statement be included in this summary to the effect that the reported occurrence of downy

mildew of tobacco in Kentucky (Downy mildew (blue mold) of tobacco, Bulletin of the North Carolina Department of Agriculture, December, 1934, page 3) is founded on an unauthenticated report. Dr. W. D. Valleau of the Kentucky Agricultural Experiment Station verbally expressed his belief, March 9, 1935, that this disease had not been observed in the State up to that date, and concurred in the request for this correction. It appears, therefore, that the distribution of the disease was not extended in 1934. The severity of attack was generally reported as lighter than in 1933, and the damage slight.

MOSAIC (virus) was reported from Massachusetts, New Jersey, Maryland, Virginia, Kentucky, North Carolina, Florida, and Ohio. Prevalence was reported less than in 1933 in Massachusetts, New Jersey and Western Kentucky, and about the same in Maryland, Florida, and Ohio. The reduction in yield in Maryland was estimated at 3 per cent with loss in quality of an additional 4 per cent. According to W. D. Valleau, several forms of mosaic were observed on tobacco in Kentucky including the vein banding type due to the rugose mosaic virus of potatoes, the cucumber mosaic, three strains of etch viruses, as well as ordinary tobacco mosaic. Tobacco growing near potatoes in places developed as high as 50 per cent infection of rugose mosaic by late summer. On the Station farm at Lexington, the etch viruses which evidently overwintered in solanaceous weeds were much more abundant than for several years. The cucumber type was also unusually prevalent on the Station farm but is not ordinarily abundant in the State except in market gardening sections. There was excellent evidence on the Station farm that several strains of the common tobacco mosaic were introduced into the plantings by insects during the summer and not on the hands of the workers. In one small field of tobacco close to a field in which numerous infected solanaceous weeds were present, with many in the plantings also, mosaic of a peculiar yellow type was present in nearly all plants by fall. The plants were not handled following setting.

RING SPOT (virus) was reported from Maryland in slight amount and from Kentucky where in contrast to certain mosaic viruses there was but little spread.

CURLY TOP (virus). This disease was observed on tobacco grown in a garden in western Oregon (P.D.R. 18: 170).

BLACK ROOT ROT (Thielavia basicola) was less prevalent than in 1933 or in average years in Massachusetts, Maryland, and Kentucky where losses of only a trace occurred; present in about the usual amounts in Virginia and the Piedmont area of North Carolina, and more prevalent than in 1933 in scattered localities in Ohio where losses were estimated at 0.5 per cent.

WILD FIRE (Bacterium tabacum). Traces of infection were observed in scattered localities in Massachusetts, Ohio and Florida. The disease occurred very generally in seed beds in Pennsylvania and Maryland but was less severe than in 1933. In Pennsylvania it developed in most fields causing an estimated loss of 15 per cent. In Maryland it developed in only a few fields, and losses were estimated at 2 per cent. It occurred in plant beds and in the field in the vicinity of Murray, Kentucky, causing considerable damage on an occasional field.

BLACK FIRE (Bacterium angulatum) was less or much less prevalent than usual with only slight losses in Massachusetts, Maryland, southwestern Virginia, North Carolina, and Ohio. Some growers in Eastern Virginia suffered heavy losses. It developed in several areas in western Kentucky at topping time and caused rather extensive damage where rains continued following topping. The disease was also reported from Tennessee. It was not observed in Florida.

GRANVILLE WILT (Bacterium solanacearum) caused some damage in Virginia and was very destructive in three counties in the Piedmont region of North Carolina where the disease is a limiting factor in production. It occurred in about the usual amount in scattered fields in Florida.

BLACK SHANK (Phytophthora parasitica nicotianae) showed some spread in the infected area near Winston-Salem, North Carolina, and was generally distributed with about the usual prevalence in Florida.

FROG EYE (Cercospora nicotianae) was unusually prevalent in southwestern Virginia, Kentucky, Tennessee where the disease was so severe in some fields that the farmers did not take the trouble to cut their tobacco, North Carolina and South Carolina; and present in about the usual prevalence generally in Florida.

ROOT KNOT (Heterodera marioni) was reported from Scott County, Virginia, North Carolina, South Carolina, Georgia, and Florida.

DAMPING OFF (Pythium, Rhizoctonia, Fusarium, etc.) was reported from Massachusetts and Ohio as less prevalent than usual and causing little or no damage.

FUSARIUM WILT (Fusarium oxysporum nicotianae). Maryland reported the usual traces of this disease. It is becoming more general in Kentucky but resistant strains of hybrid Burleys under test in infested soils gave promising results. In scattered localities in Ohio the disease was more prevalent than usual but caused no reduction in yield.

SOUTHERN STALK ROT (Sclerotium rolfsii) was reported as present and apparently increasing in prevalence in North Carolina and South Carolina.

SORE SHIN (Rhizoctonia bataticola) was reported from Kentucky as occurring during a period of high temperature. The causal organism was identified in culture.

VERTICILLIUM WILT (Verticillium albo-atrum) was reported from a field in Tennessee.

LEAF SPOT (Alternaria sp.). Florida.

FRENCHING (non-parasitic) caused a trace of loss in Maryland and was present to an unusual extent in southwestern Virginia and in Kentucky where the disease, which is most commonly found on limed land, was aggravated by heavy rains in midsummer.

DROUGHT SPOT (Physiological). Drought spot was much less prevalent than usual due to plentiful rainfall in tobacco-growing regions. It was reported as general in Western Kentucky but caused little damage.

POTASH HUNGER was estimated to cause a 10 per cent reduction in yield in Massachusetts.

HAIL INJURY. Connecticut.

SUN SCALD. Kentucky.

C O T T O N

ANTHRACNOSE (Glomerella gossypii) was reported from Tennessee, North Carolina, South Carolina, Georgia, Mississippi, Texas and Arkansas. It was estimated to have caused a loss of 37 per cent in one field in Tennessee and 10 per cent in another but occurred only locally. In North Carolina the disease was more prevalent than in 1933 but less serious on farms practicing careful seed selection. The loss was estimated at 1 per cent. Anthracnose caused heavy losses to young seedlings in South Carolina which was followed by some boll-rot with a 5 per cent reduction in yield. Three counties in northeastern Georgia reported 5 per cent loss, Mississippi the usual amount, and Texas 1 to 2 per cent. It was less prevalent than usual and of little importance in Arkansas. Reporting from Mississippi, Louisiana, and Texas, D. C. Neal of the Division of Cotton and Other Fiber Crops and Diseases writes as follows:

"Anthracnose was very prevalent this season on certain varieties in the regional cotton variety test at Rowlett, Texas. Given in order of susceptibility and damage to stands, the disease was found on the following varieties: Delfos 531-A, Arkansas Trice, Arkansas Acala 4067, Arkansas Acala 891, Arkansas 17, Arkansas Rowden, Acala Watson, Acala Rogers, D. & P. L. - 10, Stoneville 5, Oklahoma Triumph 44.

"The damage to Delfos 531-A was estimated to be about 50 per cent, which necessitated replanting. Anthracnose was also prevalent on seedlings of the above variety in the wilt experiments at Poplarville, Mississippi. Damage in Mississippi and Louisiana is estimated at about 2 per cent. The disease was negligible in Texas blackland cotton belt but caused 2 per cent loss in east Texas. The loss for the State was probably 1 to 2 per cent."

ANGULAR LEAF SPOT (Bacterium malvacearum) was very prevalent in Mississippi, Louisiana, northeastern Arkansas, and southwestern Tennessee following a tropical disturbance in July and was more prevalent than in ordinary years in North Carolina, South Carolina, and Georgia. Estimated losses reported were 2 per cent in North Carolina, South Carolina, Georgia, Mississippi, and Louisiana, and 1 per cent in Texas. Arkansas reported normal distribution but little injury except in the northeastern part of the State. One severe outbreak was reported from Puerto Rico.

SORE SHIN (Corticium vagum) occurred with the usual prevalence in Louisiana and Arkansas. The disease is said to be always important in early planted cotton in Arkansas. Seed planted the last ten days of April may often give only a half to a fourth the stand obtained from the same seed planted two weeks later.

ROOT ROT (Phymatotrichum omnivorum) caused much less loss in Texas than in 1933 due to dry weather and late occurrence of the disease. The loss is estimated at 6 to 7 per cent. Presence of the disease was also reported in Miller and Little River Counties in Arkansas.

FUSARIUM WILT (Fusarium vasinfectum) was reported from Tennessee, South Carolina, Mississippi, Louisiana, Texas, and Arkansas. According to D. C. Neal, the disease is on the decline in the Gulf Coastal Plain regions of Mississippi, Louisiana, and Texas, due to the use of wilt-resistant varieties and improved fertilizer practice. Losses for these districts are estimated at 3 per cent; for South Carolina 2, and Arkansas 5. A maximum injury of 75 per cent was reported from a field in Tennessee. A report on the effect of wilt on cotton varieties in experimental plantings in Arkansas is given in the Reporter 18:36.

VERTICILLIUM WILT (Verticillium alboatrum) was found in Tennessee and Mississippi. It caused considerable damage on black muck soil in Tennessee. Counts in one forty-acre field showed 3 per cent wilt. It was considerably less prevalent in the Mississippi Delta than usual and probably caused not more than 1 per cent loss.

POTASH HUNGER (non-parasitic) was reported from Tennessee and Mississippi in about the usual amount. In Arkansas it was very common, especially in the eastern half of the State on sandy alluvial soil, and is regarded as one of the most serious troubles of cotton. Loss was estimated at 5 per cent.

BOLL ROT (Diplodia gossypina) occurred in Louisiana and Texas but did not cause serious damage. The fungus was found attacking the roots of cotton at the U. S. Cotton Breeding Station, Greenville, Texas, resulting in death of the plants, according to D. C. Neal.

ROOT KNOT (Heterodera marioni) was reported as causing 2 per cent loss in South Carolina and in Arkansas.

MISCELLANEOUS INJURIES AND FUNGI. Drought injury caused great reduction in yield in Arkansas; lightning injury was reported from Mississippi; "sand drown" due to magnesium deficiency caused 2 per cent loss in North Carolina and a pink boll rot caused by Fusarium sp. injured the crop there to the extent of 2 per cent. A leaf and stem blight caused by Ascochyta gossypii was prevalent in parts of Walker County, Georgia.

"A Hydnaceous fungus, closely resembling Hydnum omnivorum Shear, and previously described in Jour. Agr. Res. 30: 475-477, 1925, was found by the writer attacking cotton at Poplarville and Scott, Mississippi, and also at Brenham, Texas. The fungus at Brenham occurred on the roots of plants also affected with Phymatotrichum root rot. At Scott, Mississippi, the writer, accompanied by Dr. L. E. Miles of the Mississippi Experiment Station, found the fungus on both live and dead plants and on sections of old stems with teeth of the hymenium clearly formed and bearing basidia and basidiospores. Cultures were obtained for subsequent inoculations." (D. C. Neal)

H O P S

DOWNY MILDEW (Pseudoperonospora humuli) was reported from Washington and California.

LEAF BRONZING (non-par.) occurred in Washington.

P E A N U T S

LEAFSPOT. Cercospora sp. was reported from New Jersey, C. arachidicola from Arkansas, C. personata from Kentucky.

POD ROT (Diplodia natalensis). In a carload of Spanish peanuts examined at Savannah, Georgia, 70 per cent of the hulls were black and the mycelium was penetrating the seed. At least 10 per cent of the nuts were damaged.

ROOT ROT (Sclerotium rolfsii) was reported from Tennessee and Arkansas.

D I S E A S E S O F S U G A R C R O P S

S U G A R C A N E

The following summary was prepared by the persons whose names appear at the end of the respective paragraphs.

MOSAIC (virus). The sugar district of Louisiana experienced even more abundant secondary spread of the disease than occurred during 1933. Many fields of the leading commercial variety, Co. 281, became practically 100 per cent mosaic, and nearly every field developed a high percentage. Fields of the more recently introduced and more resistant Co. 290 showed also considerable increase in mosaic percentages. One field of the usually mosaic-free, C.P. 807, developed scattered infections and occasional diseased stools were encountered for the first time in C.P. 28/11 and C.P. 28/19, released for commercial cultivation in the fall of 1934. Four distinct types of mosaic were found in Louisiana and differentiated by consistent differences in appearance on Louisiana Purple or other test varieties (Phytopath. 24: 1040-1042. Sept. 1934). Type 3, of which only about 25 affected stools have been found, is of greatest potential importance because of its severity on all varieties tested. (E. M. Summers).

RED ROT (Colletotrichum falcatum) has diminished in importance in the Sugar Belt of Louisiana with the decline in acreage of the very susceptible P.O.J. 213, which has rapidly been replaced by the resistant Co. 281 and other varieties. With very few exceptions the acreage of P.O.J. 213 planted in the past two years has been less than 10 per cent of the total, and on most plantations this has been for the purpose of maintaining a seed supply. Co. 281, Co. 290, P.O.J. 234, and C.P. 807 have continued to give satisfactory stands and to show relatively little red-rot damage following borer injury to standing cane. The same is true of the recently released C.P. 28/11 and C.P. 23/19. (E. V. Abbott).

SUGAR BEET

CURLY TOP (virus) was much more prevalent than usual in most of the area where it occurs, although in many States severe loss was concentrated in certain localities. The winter of 1933-34 in the Northwest was exceptionally mild and permitted an unusual amount of overwintering of both the beet leafhopper and susceptible host plants. As a result, abundant infection of sugar beets and other cultivated hosts was widespread early in the season. A considerable portion of the acreage planted was abandoned due to curly top. In Idaho the disease "was more severe than it has ever been since plant disease records have been kept at the Experiment Station," according to Hungerford. A similar report was made by Dana for the Pacific Northwest. In the Twin Falls section in Idaho, plantings of common commercial sugar beets were a total loss. Loss estimates were received from only three States: 75 per cent in Oregon, where sugar beets are not a sugar crop, 10 to 20 per cent in Washington, and a trace in Montana. The yield per acre harvested as compared with last year may have some significance in this connection:

State	Short tons per acre		State	Short tons per acre	
	1933	1934		1933	1934
Ohio	7.8	8.4	Wyo.	11.4	9.9
Mich.	7.8	9.2	Colo.	12.6	8.9
Wis.	-	8.5	Utah	12.3	7.2
Nebr.	12.1	9.0	Calif.	15.0	14.5
Mont.	12.3	11.6	Other		
Idaho	11.2	8.5	States	8.9	6.8

These figures are taken from U. S. Bur. Agr. Econ. Crops and Markets (vol. 11, no. 12, p. 480, Dec. 1934). Drought was certainly responsible for a large part of the reduction in yield, as evidenced by the figures for Nebraska where curly top does not occur, but it is likely that the disease was an active factor in the States where it occurred. (See also P.D.R. 18; 168, 173).

ROOT ROT (*Phoma betae*) caused losses estimated as follows: 2 per cent, Ohio, Michigan; 1, Montana; trace, Wisconsin, Minnesota. *Corticium vagum* was reported from Wisconsin, Minnesota, Wyoming and Colorado. The light incidence appeared to be correlated with the dry season.

LEAF SPOT (*Cercospora beticola*). Losses were reported as 1 per cent in Ohio and Minnesota, trace in Michigan, Wisconsin, Montana, none in Oregon. Low atmospheric humidity was unfavorable to its development.

DAMPING-OFF (various organisms) was reported from Minnesota as less prevalent than usual, due to the dry soil conditions.

NEMATODE (Heterodera schachtii), Wyoming.

DROUGHT caused a loss of 30 per cent in stand of sugar beets in Wisconsin.

D I S E A S E S O F T R E E S

Special reports on tree diseases have been contributed to this Summary by members of the Division of Forest Pathology of the Bureau of Plant Industry, and a report on white pine blister rust has been furnished by the Bureau of Entomology and Plant Quarantine.

VERTICILLIUM WILT OF MAPLES: About the usual number of inquiries concerning Verticillium were received by the Washington office during the year 1934. On maples the disease appeared in more or less epidemic form in two localities. William R. Van Dersal, of the University of Pittsburgh, Pittsburgh, Pennsylvania, reported that the disease was becoming more prevalent than formerly in that city. In certain sections about 1 per cent of the trees, mostly Norway maples, were infected. In one block ten of the thirty maples were attacked. One tree of the Schwedleri variety was killed by wilt. An infection of fifteen to twenty trees, mostly Norway maples, was reported in Bergen County, New Jersey. The season there was dry and the top soil around these trees was very shallow. The characteristic green staining was noted in these trees. G. H. Hepting reported a mild epidemic of Verticillium wilt on maples at Asheville, North Carolina.

Accumulated evidence indicates that climatic factors exercise much influence on the development of Verticillium wilt of maples, but this may not always be the case. A number of sugar maples in West Virginia became infected with Verticillium, and inquiry revealed that the trees had been heavily manured, the roots had been disturbed by plowing, and roses (a host of Verticillium) had been planted in proximity to the trees, any one of which factors might have influenced infection. (Russell Clapper, Division of Forest Pathology).

CHESTNUT BLIGHT ON THE PACIFIC COAST: The first known infection of chestnut blight (Endothia parasitica) in the western United States was found at Guntér, Oregon, on two trees in 1929. These were cut and burned by State and Federal authorities. In the spring of 1934 J. L. Mielke of the Division of Forest Pathology found a small infection on a sprout that had grown from one

of the originally infected trees and removed the sprout. When the planting at Gunter was visited in September, 1934, by Mielke and the writer, the chestnut-blight fungus was found on the stump about a foot below the ground. This stump was burned.

In Seattle, Washington, no blight infections have been reported since the removal of the infection that Dr. John W. Hotson found on American chestnut trees in 1932.

In the fall of 1934 the writer visited the Agricultural Experiment Station at Agassiz, British Columbia. One European chestnut infected with the blight was found. Another tree near it was healthy. No evidences of blight were noted on a number of other trees in and near Agassiz. The Dominion authorities have destroyed the infected tree.

In October, 1934, the writer discovered a blighted European chestnut tree in an orchard near Stockton, California. Cooperatively, the County Commissioner and his force, the State Plant Pathologist and his assistants, and members of the Division of Forest Pathology inspected the chestnut plantings and nurseries in California. No blight infections were found in other parts of the State, but in Stockton more than forty infected trees were found. Most of these occurred in one orchard. All infected trees found were eradicated by the State authorities. At Stockton the blight seemed to show greater virulence than it does on European chestnuts in the East. (G. F. Gravatt, Division of Forest Pathology).

ENDOCONIDIOPHORA FIMBRIATA ON SYCAMORE: Endoconidiophora fimbriata was isolated from stained areas in the trunk and limbs of a thirty-year-old dead sycamore in Washington, District of Columbia. This tree was one of a number which died recently in a street planting. The stained areas from which the fungus was isolated occupied about one-third of the circumference of the tree and extended radially nearly to its center; and it ran from the ground entirely up the trunk and into several lateral branches. (Bowen S. Crandall, Division of Forest Pathology).

STEREUM GAUSAPATUM ON OAK: In 1934 Stereum gausapatum was found to be one of the organisms causing a common type of decay in oak stands of some of the eastern States (Stereum gausapatum, cause of heart-rot of oaks. Phytopath. 24: 831-832. 1934). It has been obtained from living trees in North Carolina, West Virginia, Virginia, Pennsylvania, New Jersey, New York, and Connecticut. Most of the important oak species, such as Quercus prinus, Q. alba, Q. coccinea, Q. velutina, and Q. rubra, are susceptible. A few isolations from trees in a coppice growth indicated that a large percentage of damage was caused by this fungus

and a more intensive study of butt rot of sprout oak stands was started. Ross W. Davidson, Division of Forest Pathology)

PHYTOPHTHORA PARASITICA ON BLACK LOCUST: Top wilt caused by Phytophthora parasitica caused heavy losses in seed beds of black locust at Charlottesville, Virginia, and Raleigh, North Carolina. Outbreaks of the disease appeared after heavy rains and seedlings less than a month old were attacked. (Bowen S. Crandall, Division of Forest Pathology)

WILLOW DISEASES IN 1934: The recent impetus given to soil erosion control and the use of willow species in this work have increased the importance of willows and their diseases. A survey was made during the summer of 1934 to find out what diseases were prevalent on willows and what damage they were doing.

WILLOW SCAB (Fusicladium saliciperdum). During the summer of 1934 willow scab was severe in the New England States and eastern New York. The disease occurred as far west as Ithaca, New York and Warren, Pennsylvania. Its present known distribution is New England, New York, northern Pennsylvania, and northern New Jersey, but its spread some hundreds of miles beyond its present limits is to be expected within the next decade.

BLACK CANKER (Physalospora miyabeana). During the summer of 1934 severe damage was observed on trees along streams in western Connecticut. It appears to follow the willow scab disease and to increase the damage already done by the scab fungus. The present known distribution of black canker is through New England and eastern New York. It does not appear to be spreading as rapidly as willow scab.

CYTOSPORA CANKER (Cytospora chrysosperma). This disease of willow has long been known in the United States. It affects other broadleaf trees besides willows. The disease is widespread, but is most common and destructive in the Southwest and Midwest. It was especially severe in the Midwest during the season of 1934.

CANKER AND DIEBACK DISEASE. During the summer of 1934 a canker and dieback disease has occurred in numerous places through the Midwest and South. An undetermined fungus has been isolated in nearly all cases, but its pathogenicity has not been proved. (H. F. Winter, formerly Technician Emergency Conservation Work, Division of Forest Pathology)

DUTCH ELM DISEASE: During the year Ceratostomella ulmi was isolated from samples from 6,913 trees, or 40.9 per cent of the total specimens received at the Dutch Elm Disease Laboratory, Morristown, New Jersey. From the beginning of the work in Ohio

in 1930 to January, 1935, 7,790 cases of the disease had been confirmed by the laboratory.

Investigation of the prevalence of C. ulmi in dead or approximately half dead elms in the New York-New Jersey area indicated that about 10 per cent of the trees falling within this class was infected. Available customs records showed that elm logs had entered several ports and had been shipped to a number of Midwest cities (P.D.R. 19: 11-14. 1935), including Indianapolis where the disease was found near veneer mills. A case of the disease was found near the docks at Norfolk, Virginia.

Considerable variation was noted in cultural characteristics of various isolants of the fungus. Some of the cultures resembled those of other species of *Graphium* and *Ceratostomella* isolated from discolored elm wood or bark.

The perfect stage of the fungus was produced on sterilized elm twigs by combining certain single spore strains. These strains did not produce perithecia when grown alone under similar conditions. Strains producing perithecia when combined have been isolated from trees in New York and New Jersey. (Curtis May, Division of Forest Pathology)

CEPHALOSPORIUM DIEBACK OF ELMS: Cephalosporium sp. was isolated from 28.2 per cent of the 16,921 specimens suspected of having the Dutch elm disease and submitted to the Dutch Elm Disease Laboratory, Morristown, New Jersey, for culturing. The specimens of *Cephalosporium* came from twenty States and Canada, from Oklahoma north to North Dakota and eastward to Virginia and Nova Scotia. The disease continues to be prevalent in native stands and planted elms throughout northeastern United States, causing much disfiguration and occasionally death of trees. (Gross, R. W., and P. R. Frink. *Cephalosporium* wilt and die-back of the white elm. Nebraska Agr. Exp. Sta. Res. Bul. 70. 1934). (A. F. Verrall, Emergency Conservation Work, Division of Forest Pathology)

ELM WILT CAUSED BY VERTICILLIUM: Verticillium sp. was isolated at the Dutch Elm Disease Laboratory from 3.8 per cent of the 16,921 samples of elm suspected of being affected with the Dutch elm disease. The specimens of *Verticillium* came from trees in twenty-four States and the District of Columbia, from Oregon and Colorado eastward to Maine and Tennessee. Some trees known to be affected in previous years showed no external symptoms of disease this year, but other trees continued to decline. (E. G. Kelsheimer, Emergency Conservation Work, Division of Forest Pathology)

PHYTOPHTHORA CINNAMOMI CAUSING TREE DISEASE: Phytophthora cinnamomi was found causing root and collar rot of three-year-old Norway spruce at Charlottesville, Virginia. A 2 per cent loss from this cause occurred. The same species continues to cause heavy losses on red pine at College Park and Branchville, Maryland, and on red oak at College Park. (Bowen S. Crandall, Division of Forest Pathology)

WHITE PINE BLISTER RUST IN 1934: During 1934, the spread of white pine blister rust (Cronartium ribicola) in the Eastern white pine regions was evidenced by the finding of the disease on white pine for the first time in Sussex and Passaic Counties, New Jersey; Allegany and Garrett Counties, Maryland; Pendleton County, West Virginia; Geauga County, Ohio; Dubuque County, Iowa; Becker County, Minnesota; Chippewa, Jackson, Marathon, Oneida, Adams, and Lincoln Counties, Wisconsin; and Ontonagon, Leelanau, Emmet, Otsego, Alcona, and Sanilac Counties, Michigan. Infection on Ribes was found for the first time in Nelson County, Virginia, and in Frederick and Montgomery Counties, Maryland.

In the West, a new pine infection center was located on Steamboat Creek, Douglas County, Oregon, about 100 miles from California, but scouting in the sugar pine forests of northern California failed to reveal the presence of the rust. In the western white pine region of northeastern Washington, northern Idaho, and northwestern Montana, 39 new centers of pine infection were reported, making a total of 129 for the region. All of these have developed within the last twelve years and there are undoubtedly many others still undiscovered. Of the 39 new centers, 8 were in northern Idaho and northeastern Washington on the Kaniksu National Forest; one on the Lolo National Forest; and 4 on the Cabinet National Forest in Montana. This is the first record of pine infection in Montana, and in these national forest units.

Careful inspection and study of numerous white pine areas show that very little new infection is occurring on white pines in those areas that have been brought under control by the eradication of Ribes, but in similar unprotected areas the rust is increasing rapidly and causing serious losses in white pine stands, particularly among the younger age classes. (Bureau of Entomology and Plant Quarantine).

H A R D W O O D S

ACER SPP. MAPLE: Cytospora sp. caused CANKER of Norway maple, A. platanoides, in New Jersey and Massachusetts, and was found in connection with the perfect stage Valsa pauperata on silver maple, A. dasycarpum, in Massachusetts. LEAF BLIGHT (Gloeosporium sp.) was severe in Virginia and was reported from Massachusetts on sugar maple, A. saccharum. ANTHRACNOSE (G. apocryptum) on Norway maple in New Jersey and Delaware. ANTHRACNOSE (G. saccharini), Connecticut. TWIG BLIGHT (Nectria cinnabarina) on Japanese maple, A. palmatum, Massachusetts. The conidial stage, Tubercularia vulgaris, occurred on Japanese maple and sycamore maple, A. pseudoplatanus, in Connecticut, probably following injury from other causes. CANKER (Phomopsis sp.) on Japanese maple in New Jersey. LEAF SPOT (Phyllosticta minima) on silver maple, Virginia. ROOT ROT (Phymatotrichum omnivorum), Texas, on maple and boxelder, A. negundo. TAR SPOT (Rhytisma acerinum), Connecticut, Michigan, Wisconsin. Silver maples in low swampy places were heavily infected in various parts of the Lower Peninsula of Michigan. TAR SPOT (R. punctatum) on mountain maple, A. spicatum, Massachusetts. CANKER (Sphaeropsis sp.), New Jersey, on Japanese maple.

WILT (Verticillium sp., reported as V. alboatrum in Ohio and V. dahliae in New Jersey) was said to be more evident than usual in Ohio and Connecticut while the normal amounts occurred in Michigan and Wisconsin. In New Jersey, the number of Norway maple trees attacked increases every year. Norway maple was affected in Connecticut also. Other maples mentioned specifically were Japanese maple in Connecticut and New Jersey, silver maple in Connecticut, and sugar maple in Massachusetts. (See also page 97).

LEAF SCORCH due to hot dry weather was said to be more common than usual on Norway and sugar maples in Ohio and was also reported from Connecticut. LEAF SPOT and MARGINAL NECROSIS due to frost injury, Washington. WINTER INJURY, Connecticut.

AESCULUS SPP. BUCKEYE, HORSE CHESTNUT: LEAF BLOTCH, (Guignardia aesculi) generally was widespread and about as prevalent as usual on horse chestnut. Connecticut and Michigan reported less due to dry hot weather. CANKER (Nectria cinnabarina), New Hampshire. LEAF BLIGHT due to frost injury, Washington. SLIME FLUX (undet.), New Jersey.

ALEURITES SPP.: THREAD BLIGHT (Corticium stevensii) on the tung-oil tree, A. fordii, in Florida. CANKER (Nectria cinnabarina), on A. cordata in Massachusetts.

ALNUS SP. ALDER: LEAF BLIGHT (Botrytis cinerea). Washington.

BETULA SPP. BIRCH: CANKER (Nectria galligena), Connecticut.
WOOD DECAY (Polyporus sp.), New Jersey, on B. nigra.

CASTANEA SPP. CHESTNUT: BLIGHT (Endothia parasitica). See page 97. Connecticut reported that generally seedlings and sprouts looked better than usual, and a considerable number of burrs and nuts were found on the older ones. In New Jersey more root sprouts bear nuts every year, apparently.

CATALPA SPP. CATALPA: LEAF SPOT (Phyllosticta catalpae), New Jersey, on C. bungei.

CORNUS SPP. DOGWOOD: TWIG BLIGHT (Botrytis sp.), Washington.
LEAF SPOT due to disturbed water relations, Washington.

CRATAEGUS SPP. HAWTHORN: BLIGHT (Bacillus amylovorus) on C. oxyacantha in Massachusetts and New Jersey.

LEAF AND FRUIT BLIGHT (Entomosporium maculatum), Connecticut.
LEAF SPOT, (E. thuemenii), New Jersey, on C. oxyacantha. RUST (Gymnosporangium clavipes), New Jersey, on C. oxyacantha. RUST (G. globosum), Connecticut, on C. oxyacantha. RUST (G. juniperi-virginianae), Wisconsin.

HICORIA SPP. HICKORY, PIGNUT: LEAF SPOT (Marssonina juglandis) caused complete defoliation of some hickory trees in New Jersey.

LIRIODENDRON TULIPIFERA. TULIP TREE: ANTHRACNOSE (Gloeosporium liriodendri), New Jersey. LEAF SPOT (Phyllosticta liriodendrica), Massachusetts.

OSTRYA VIRGINIANA. HOPHORNBEAM, IRONWOOD: LEAF SPOT (Taphrina virginica), common in May on trees along rivers in Clarke County, Georgia.

PLATANUS SPP. PLANETREE, SYCAMORE: Endoconidiophora fimbriata, see page 98. ANTHRACNOSE (Gnomonia veneta) was generally less prevalent than usual on American planetree, P. occidentalis. It was widespread and caused considerable defoliation in Tennessee, and was destructive on trees in river bottoms in Arkansas. It was reported on sycamore from Washington. TWIG BLIGHT (Massaria platani). Reported on American planetree from Ohio, suspected as being a factor in twig death and fall.

POPULUS SPP. POPLAR, COTTONWOOD, ASPEN: LEAF BLIGHT (Cladosporium epiphyllum). Washington, on cottonwood. CANKER (Cytospora chrysosperma). Massachusetts on Bolleana poplar, P. bolleana; New Jersey, Ohio, Texas. CANKER (Dothichiza populea). Massachusetts, on Bolleana poplar; Wisconsin. LEAF SPOT (Marssonina sp.), Washington, on silver poplar. RUST (Melampsora occidentalis), Washington, on cottonwood.

QUERCUS SPP. OAK: STEM BLIGHT (Aleurodiscus acerinus), Texas, on live oak, Q. virginiana. ROOT ROT (Armillaria mellea), Massachusetts, New Jersey, Wisconsin. CROWN ROT (Corticium sp.), Texas, on live oak. DIEBACK (Diplodia longispora), New Jersey, on Q. montana. BROWN OAK (Fistulina hepatica), P. D. R. 19: 95. ANTHRACNOSE (Gnomonia veneta) was generally reported as less prevalent than usual; however, more was observed in Massachusetts. POWDERY MILDEW (Microsphaera alni), New Jersey, on Q. alba. LEAF SPOT (Phyllosticta sp.), New Jersey. ROOT ROT (Phytophthora cinnamomi, see page 10. HEART ROT (Polyporus graveolens, Georgia, on black oak, Q. velutina. ROT (P. sulphureus), Connecticut, on living black oak. TWIG CANCKER (Sphaeropsis sp.), New Jersey. HEART ROT (Stereum gausapatum), see page 98. BLISTER (Taphrina coerulescens), New Jersey, Georgia, Mississippi, Texas. STEM BLIGHT (Trabutia erythrospora), Texas, on live oak. SLIME FLUX (undet.), New Jersey, on Q. alba and Q. rubra.

ROBINIA PSEUDOACACIA. BLACK LOCUST: TOP WILT (Phytophthora parasitica), see page 99. DAMPING-OFF (Rhizoctonia solani) affected about 75 per cent of the seedlings in a TVA nursery in Clinton County, Tennessee, in August. It caused severe defoliation and death of some plants. P.D.R. 18: 139. DIEBACK (nonpar.), Washington.

SALIX SPP. WILLOW: A report on Willow diseases is given on page 99. CANCKER (Cytospora chrysosperma), on pussy willow, S. discolor, in New Jersey and Ohio; on weeping willow, S. babylonica, New Jersey; also reported from Wisconsin. See also page 99. SCAB (Fusicladium saliciperidum), see page 99. TWIG BLIGHT (Gloeosporium sp.) caused considerable dying of twigs in Delaware. LEAF SPOT (Marssonina sp.), Washington. BLACK CANCKER (Physalospora miyabeana), see page 99.

SORBUS AMERICANA. MOUNTAIN ASH: BLIGHT (Bacillus amylovorus), New Jersey. TWIG BLIGHT (Phomopsis sp.), Massachusetts, killed 50 per cent of the twigs back from the tips.

TILIA AMERICANA. AMERICAN LINDEN: POWDERY MILDEW (Erysiphe sp.), New Jersey. CANCKER (Nectria sp.), New Jersey.

ULMUS SPP. ELM: LIMB CANCKER (Botryosphaeria ribis), Arkansas, on Chinese elm, U. parviflora. WILT AND DIEBACK (Cephalosporium sp.), see page 100. DUTCH ELM DISEASE (Ceratostomella ulmi), see page 99. Collybia velutipes, Connecticut. CANCKER (Conithyrium sp.), Illinois (P.D.R. 19: 14). CANCKER (Cytosporina sp. ? ludibunda), Illinois (P.D.R. 19: 14). Fusarium sp., Connecticut. ANTHRACNOSE (Gnomonia ulmea) was much more prevalent in Connecticut than usual. New Jersey, Ohio, and Michigan reported it as doing little damage. CANCKER (Macrophoma sp.), Pennsylvania. CANCKER (Phoma sp.), Illinois

(P.D.R. 19:14). NURSERY BLIGHT (Phomopsis sp.), Massachusetts. Pleurotus ulmarius, Connecticut. Polystictus conchifer, Connecticut. CANKER AND DIEBACK (Sphaeropsis ulmicola), New Jersey, Wisconsin. WILT (Verticillium sp.), see page 35-36, 100. Reports were received from Massachusetts, Connecticut, New Jersey, Ohio.

C O N I F E R S

CHAMAECYPARIS THYOIDES. WHITE CEDAR: RUST (Gymnosporangium ellisii), New Jersey.

CUPRESSUS SPP. CYPRESS: WILT (undet.), caused death of many trees five to eighteen feet high in nurseries near Concord, Georgia, in July.

JUNIPERUS SPP. JUNIPER, RED CEDAR: RUST (Gymnosporangium juniperi-virginianae), on red cedar in Connecticut, New Jersey, Tennessee, Wisconsin, Minnesota, Kansas. There seemed to be fewer galls than usual probably due to the dry weather. Relative susceptibility of species and varieties of Juniperus as observed in a planting in Tennessee is reported in P.D.R. 18: 163. BLIGHT (Phomopsis juniperovora), New Jersey, on red cedar. LEAF CAST (undet.). Washington, on Juniper.

PICEA SPP. SPRUCE: ROOT AND COLLAR ROT (Phytophthora cinnamomi). See page 101.

PINUS SPP. PINE: WHITE PINE BLISTER RUST. See page 101. ROOT ROT (Phytophthora cinnamomi). See page 101. Rhizina inflata caused DYING of red pine seedlings in a nursery in Maryland. P.D.R. 19: 96.

TAXUS SPP. YEW: CANKER (Phomopsis sp.). New Jersey, on T. hicksii. WINTER INJURY. Species of Taxus suffered little damage in New Jersey.

THUJA SPP. ARBORVITAE: DYING, cause unknown. Many trees in Concord, Macon, and Augusta, Georgia, died during the summer from an unknown cause. No parasitic organism was found to be associated. WINTER INJURY was severe in Virginia.

TSUGA CANADENSIS. HEMLOCK: LEAF BLIGHT (Keithia tsugae), Massachusetts. RUST (Melampsora abietis-canadensis) Massachusetts. TWIG BLIGHT (Phomopsis sp.), New Jersey.

D I S E A S E S O F O R N A M E N T A L S

ACONITUM SP. MONKSHOOD: STEM ROT (Rhizoctonia solani), New Jersey. CROWN ROT (Sclerotium delphinii), New Jersey. WILT (Verticillium sp.), Massachusetts.

ALTHAEA ROSEA. HOLLYHOCK: LEAF SPOT (Cercospora althaeina), Connecticut, New York. ANTHRACNOSE (Colletotrichum sp.), New Jersey. LEAF SPOT (Phyllosticta sp.), New Jersey. RUST (Puccinia malvacearum) was widely reported. It was said to be less abundant than usual in Connecticut and New York, and much less prevalent in Michigan and Wisconsin. Georgia noted complete destruction of the host in gardens.

ALYSSUM SPP. ALYSSUM: ROOT ROT (Rhizoctonia sp.), New York.

AMELANCHIER SP. JUNE BERRY: BLIGHT (Bacillus amylovorus), Montana, on A. alnifolia.

AMYGDALUS SP. FLOWERING PEACH: LEAF CURL (Exoascus deformans) was serious in May on the University campus and in gardens at Athens, Georgia.

ANTIRRHINUM MAJUS. SNAPDRAGON. ANTHRACNOSE (Colletotrichum antirrhini), New York and Mississippi. STEM ROT OR CANKER (Fusarium sp.) occurred on the varieties Cheviot Maid and Sun Tan in the College greenhouse at Athens, Georgia. The lesions girdle the stem and the branch dies. ROOT KNOT (Heterodera marioni), Mississippi. STEM CANKER (Phyllosticta antirrhini), Washington. RUST (Puccinia antirrhini) was widespread and generally about as prevalent as usual. Reports came from Massachusetts, New Jersey, Pennsylvania, Virginia, Georgia, Mississippi, Wisconsin, Minnesota, Kansas, Colorado, and Washington. STEM ROT (Sclerotinia sclerotiorum) caused from 20 to 30 per cent loss in an extensive planting in one greenhouse in Michigan. The loss for the State was 2 per cent. WILT (Verticillium sp.), New Jersey.

ARISTOLOCHIA SP.: LEAF SPOT (Phyllosticta aristolochiae), New Jersey.

ASPARAGUS ASPARAGOIDES. SMILAX ASPARAGUS. CANKER AND LEAF SPOT (Fusarium sp.) ruined several houses of smilax in New Jersey.

ASTER FRIKARTI. ASTER: RUST (Coleosporium solidaginis), Connecticut.

AUCUBA JAPONICA AUREA. JAPANESE AUCUBA: LEAF SPOT (Colletotrichum pollacii), New Jersey. LEAF SPOT (Pestalotia aucubae), New Jersey.

AZALEA SPP. AZALEA. (See also Rhododendron): BLIGHT (Botrytis, cinerea type) on A. pontica in New Jersey. LEAF HYPERTROPHY (Exobasidium sp.), Washington. E. vaccinii caused GALLS on A. hinodegiri and A. indica and LEAF SPOT on A. pontica in New Jersey. WILT, (Fusarium sp.), New Jersey. POWDERY MILDEW (Microsphaera alni), New Jersey. STEM CANKER (Phomopsis sp.), Massachusetts. LEAF SCORCH (Septoria azaleae) on A. indica and A. hinodegiri in New Jersey. BUD BLIGHT (Sporocybe azaleae), Massachusetts. STEM BLIGHT (Verticillium sp.), Massachusetts. FLOWER SPOT (undetermined fungus) was again prevalent in several public gardens and nurseries in the vicinity of Charleston, South Carolina.

BEGONIA SPP. BEGONIA: NEMATODE LEAF SPOT (Aphelenchoides fragariae), New Jersey. LEAF BLIGHT (Botrytis sp.), New York, New Jersey. LEAF SPOT (Phyllosticta sp.), New Jersey. CORKY OUTGROWTH on the leaves (non-parasitic), Pennsylvania.

BERBERIS THUNBERGII. JAPANESE BARBERRY: BACTERIAL LEAF SPOT, New Jersey. WILT (Verticillium sp.), New York and New Jersey.

BUXUS SPP. BOX: LEAF SPOT (Macrophoma candollei), Massachusetts and Mississippi. LEAF BLIGHT AND CANKER (Nectria rousseliana (Volutella buxi)), Massachusetts, Georgia, Mississippi. LEAF SPOT (Phoma sp.), New Jersey. WINTER INJURY, severe in New Jersey and Virginia.

BUXUS SEMPERVIRENS SUFFRUTICOSA. DWARF BOX: LEAF SPOT (Macrophoma candollei), New Jersey. LEAF BLIGHT AND CANKER, (Nectria rousseliana), New Jersey.

CALENDULA OFFICINALIS. CALENDULA. (POT MARIGOLD): POWDERY MILDEW (Oidium sp.). A severe outbreak occurred in New York. Previously it had been rare in that State. STEM ROT (Rhizoctonia solani), New Jersey. YELLOWs (virus), Connecticut and New York.

CALLISTEPHUS CHINENSIS. CHINA ASTER. RUST (Coleosporium solidaginis) was serious in up-State New York. Excellent control with sulphur dust was reported. In Michigan, rust was destructive in cloth houses where the overhead sprinkling system was used, but was not important on asters grown outdoors. Other States reporting the occurrence of aster rust were Connecticut, New Jersey, Arkansas, Ohio, and Wisconsin.

WILT (Fusarium sp.), Washington. WILT (F. conglutinans callistephi). For the first time in several seasons wilt was more important than yellows in Michigan, and in Wisconsin also there was much more than usual. Hot weather favored the development of the disease in both States. In Minnesota, on the other hand, scarcely any reports of either wilt or yellows were received. Wilt-resistant

varieties were used extensively. According to L. R. Jones, a strain of the wilt organism found in Indiana is pathogenic to aster selections that are resistant in other parts of the country where they have been tested. Connecticut, New York, New Jersey, Ohio, and North Dakota noted about the usual prevalence.

STEM CANKER (Phomopsis callistephi), Wisconsin. STEM ROT (Rhizoctonia solani), Connecticut and New Jersey. WILT (Verticillium sp.), Massachusetts.

YELLOW (virus) was more prevalent than usual in New York, perhaps due to the abundance of the insect vector. Exactly the opposite condition in both respects was reported from Michigan. New York, Wisconsin, and Minnesota reported that growers have been using cloth tents successfully. Connecticut, New Jersey, Ohio, and Washington reported about the usual prevalence.

CAMELLIA JAPONICA. CAMELLIA: BRANCH DIE-BACK (Gloeosporium sp.) was reported in Georgia. In nurseries and private gardens at Thomasville 10 to 20 per cent infection was observed. The disease occurred in Savannah also. LEAF SPOT (Hendersonia subalbicans), Georgia. LEAF SPOT (Monochaetia camelliae), Georgia. LEAF SPOT (Pestalotia guepini), New Jersey and Mississippi.

CAMPANULA MEDIUM. CANTERBURY BELLS: STEM ROT (Rhizoctonia solani), Connecticut, new host for the State.

CANNA INDICA. CANNA: BACTERIAL BUD ROT (Bacterium cannae), Mississippi.

CATTLEYA SP.: RUST (Uredo behnickiana P. Henn.) occurred on imported plants in one greenhouse in New Jersey. There was less than 1 per cent infection.

CELOSIA SP. COCKSCOMB: A LEAF SPOT was severe in one field at Camden, New Jersey. Isolations yielded both Alternaria and Phyllosticta.

CENTAUREA CYANUS. CORNFLOWER: ROOT ROT (Rhizoctonia sp.) caused severe loss in a commercial planting for cut flowers in Nassau County, New York.

CHRYSANTHEMUM HORTORUM. CHRYSANTHEMUM: LEAF NEMATODE (Aphelenchoides fragariae (A. ritzema-bosi)), was reported for the first time from Connecticut where it was serious on the variety Mercury in one nursery. It was more prevalent than usual in southern New York and was rather serious on Long Island where wet weather favored its spread in outdoor plantings. The variety Majestic was very resistant and Yellow Pockett, White Pockett, and

Bronze Pockett very susceptible. The nematode was also reported from Washington.

LEAF SPOT (Cylindrosporium chrysanthemi), Connecticut.
POWDERY MILDEW (Erysiphe cichoracearum), New York, New Jersey, and Pennsylvania. STEM ROT (Fusarium sp.), New Jersey.

RUST (Puccinia chrysanthemi). A severe outbreak occurred on chrysanthemums, both out-of-doors and under glass, in southern New York. The varieties Early Frost, Indianola, Marie de Petris, and Rose Chocard were said to be very resistant, while Ambassador, Mrs. H. E. Kidder, Uvalda, Nubian, and Silver Sheen were very susceptible.

LEAF SPOT (Septoria sp.), Washington. LEAF SPOT (S. chrysanthemella), New York and New Jersey. WILT (Verticillium sp.), New Jersey and Washington. YELLOWS (virus), Connecticut, new to the State. CRACK-NECK (non-parasitic), Washington.

CHRYSANTHEMUM LEUCANTHEMUM. OX-EYE DAISY: STEM NEMATODE (Anguillulina dipsaci) was found on this new host on Long Island.

CIBOTIUM SCHIEDEI. TREE FERN: BLIGHT (Pestalotia cibotii), New Jersey.

CITRUS SP.: FRUIT ROT (Penicillium glaucum) occurred on a potted ornamental orange in Massachusetts.

CITRUS TAITHEISIS. TAHITI ORANGE: WITHER TIP (Colletotrichum gloeosporioides), New Jersey.

CLEMATIS SPP. CLEMATIS: LEAF AND STEM BLIGHT (Ascochyta clematidina) seems to be on the increase in New York. RUST (Puccinia rubigo-vera), New York.

COLEUS SPP. COLEUS: BACTERIAL LEAF SPOT was reported from New Jersey.

COTONEASTER SPP. COTONEASTER: BLIGHT (Bacillus amylovorus) occurred in New Jersey and was said to be destructive in Georgia. SCAB (Venturia sp.), Washington.

CYCLAMEN PERSICUM (C. indicum). PERSIAN CYCLAMEN: BLIGHT (Botrytis sp.), New Jersey. STUNT (Cladosporium cyclaminis), New Jersey.

DAHLIA SPP. DAHLIA: WILT (Bacterium solanacearum) was observed in a planting in Michigan. BUD ROT (Botrytis sp.), New Jersey. POWDERY MILDEW (Erysiphe polygoni), New Jersey and Mississippi.

LEAF BLIGHT (Macrosporium sp.), Mississippi. MOSAIC (virus) caused about 50 per cent loss in Michigan where it was the most important disease in most plantings. Other States reporting its presence were Connecticut, New Jersey and Wisconsin. RING SPOT (virus) was observed rather generally in a collection of about one hundred varieties in Michigan. LEAF CRINKLING AND NECROSIS due possibly to frost, Washington.

DAPHNE SP. DAPHNE: Rhizoctonia sp. was reported as the cause of a WET STEM ROT and WILT in Orleans County, New York.

DELPHINIUM SPP. LARKSPUR: BACTERIAL LEAF SPOT or black spot (Bacterium delphinii) seemed to be less prevalent than usual. It was reported from Massachusetts, Connecticut, New York, New Jersey, Mississippi, Wisconsin, and Washington. BLIGHT (Botrytis sp.) was much less prevalent in Wisconsin due to dry weather. POWDERY MILDEW (Erysiphe polygoni), Massachusetts, New York, and Washington. ROOT ROT (Sclerotinia sclerotiorum), Massachusetts. CROWN ROT (Sclerotium delphinii) caused 50 per cent infection in one planting in Pennsylvania. The loss for the State was 5 per cent. Other States reporting its presence were Connecticut, New York, New Jersey, Mississippi, and Arkansas. STUNT (virus), New York and Washington.

DIANTHUS CARYOPHYLLUS. CARNATION: LEAF SPOT (Alternaria sp.) seemed to be more prevalent and serious than usual in New York and was reported from Massachusetts, New Jersey and Delaware. BACTERIAL LEAF SPOT (Bacterium woodsii), Massachusetts, New Jersey. BLIGHT (Botrytis sp.), New Jersey. SCAB (Cladosporium herbarum nodosum) affected 50 per cent of the plants in some greenhouses in Georgia. WILT (Fusarium dianthi), Washington. FAIRY RING (Heterosporium echinulatum), Washington. STEM ROT (Rhizoctonia sp.), Massachusetts, Kansas. BUD BLIGHT (Sporotrichum poae), New Jersey and Kansas. RUST (Uromyces caryophyllinus) seemed to be prevalent in greenhouses, but was controlled with proper practices. Ivory, Enchantress, Aviator, and Spectrum were reported to be resistant in Georgia, while Joy and Del Ray were very susceptible. WILT (Verticillium dahliae), New Jersey.

DIGITALIS PURPUREA. COMMON FOXGLOVE: STEM ROT (Rhizoctonia solani), New Jersey.

ECHINOPS SP. GLOBETHISTLE: CROWN ROT (Sclerotium delphinii), Connecticut.

ELAEAGNUS SP. ELAEAGNUS: CROWN GALL (Bacterium tumefaciens), Georgia.

ERIGERON SP. FLEABANE: WILT (Verticillium sp.), Massachusetts.

EUONYMUS SPP. EUONYMUS: LEAF SPOT (Cercospora destructiva), Arkansas. POWDERY MILDEW (Oidium euonymi-japonici), Louisiana.

EUONYMUS JAPONICUS. EVERGREEN BURNINGBUSH: LEAF SPOT (Exosporium concentricum), Mississippi. POWDERY MILDEW (Oidium euonymi-japonici), Mississippi. LEAF SPOT (Septoria euonymi), Mississippi.

FARFUGIUM GRANDE (Ligularia kaempferi aureomaculata).
LEOPARD PLANT: LEAF SPOT (Gloeosporium sp.), Ohio.

FREESIA SPP. FREESIA: SCAB (Fusarium sp.) sometimes causes 100 per cent loss of freesias forced under glass, in New York. Golden Daffodil and Golden Treasure are resistant, whereas Purity is very susceptible.

GARDENIA FLORIDA. CAPE-JASMINE: ROOTKNOT (Heterodera marioni), New Jersey. CANKER (Phomopsis sp.), Massachusetts and New Jersey. LEAF AND BUD DROP (non-parasitic), Washington.

GERBERA JAMESONI. FLAME-RAY GERBERA: LEAF SPOT (Botrytis cinerea type), New York. DIE-BACK of flower stems (Gloeosporium sp.), New York.

GLADIOLUS SP. GLADIOLUS: BACTERIAL BLIGHT (Bacterium gum-misudans), Wisconsin and Minnesota. SCAB (Bacterium marginatum) caused 4 per cent loss in Massachusetts; 75 per cent infection and death in two gardens in Athens, Georgia; and also occurred in New York, New Jersey, Ohio, and Washington. CORM ROT (Fusarium sp.), Massachusetts, Mississippi, Wisconsin. CORM ROT (Penicillium gladioli), Massachusetts, New Jersey, Wisconsin. DRY ROT (Sclerotinia gladioli), New Jersey. HARD ROT (Septoria gladioli), New Jersey, Mississippi, Wisconsin. CRACK NECK (non-parasitic), Washington.

GYPSOPHILA PANICULATA. BABYSBREATH: CROWN, STEM, AND ROOT GALLS (Bacterium gypsophilae), Eastern United States.

HEDERA HELIX. ENGLISH IVY: BACTERIAL LEAF SPOT (Bacterium hederae), New Jersey, Ohio, Missouri. LEAF SPOT (Phyllosticta concentrica), Massachusetts, the District of Columbia, and Washington.

HELICHRYSUM SPP. EVERLASTING: YELLOWS (virus), New York.

HIPPEASTRUM SP. AMARYLLIS: Stagonospora curtisii was found on greenhouse or house plants from several sources, including New York, Ohio, Illinois, and South Carolina.

HYACINTHUS SPP. HYACINTH: ROOT ROT was reported from New Jersey. The affected roots had a glassy appearance. A Phytophthora was isolated.

HYDRANGAEA SPP. HYDRANGAEA: LEAF SPOT (Cercospora sp.), Delaware. POWDERY MILDEW (Oidium sp.), New Jersey. LEAF SPOT (Phyllosticta hydrangeae), New Hampshire and Georgia.

ILEX SPP. HOLLY: LEAF SPOT (Phyllosticta sp.) on I. opaca in New Jersey. ALGAL LEAF SPOT (Pleurococcus sp.), Washington. NON-PARASITIC LEAF SPOT, Washington.

IRIS SPP. IRIS: BACTERIAL SOFT ROT (Bacillus carotovorus) was reported as occurring in the usual amounts or less in New York, New Jersey, Georgia, Mississippi, and Wisconsin. In Minnesota there was more than usual.

CROWN ROT (Botrytis sp.), Washington. CROWN ROT (Botrytis convoluta) was reported for the first time from Minnesota where it was very severe on about 100 varieties grown in the vicinity of St. Paul. (P.D.R. 18: 103, 19: 7-9).

LEAF SPOT (Didymellina iridis, D. macrospora (Heterosporium gracile)) was reported generally as being less prevalent than in the last few years. Reports were received from Massachusetts, Connecticut, Wisconsin, Kansas, Washington, and Oregon. According to F. P. McWhorter, an exceptionally severe outbreak of "fire" occurred in Oregon and Washington on Iris xiphium and I. tingitana hybrids (Dutch and Spanish iris), in early March, 1934, following several weeks of unseasonably warm weather in February. The foliage was entirely killed to the ground in some cases, including several large, exceptionally well-managed plantings. The only fungus consistently associated with the disease, and proved by inoculation experiments to be pathogenic to both German (rhizomatous) and Dutch (bulbous) irises was Heterosporium gracile. This was subsequently shown to be the conidial stage of Didymellina macrospora Klebahn.

LEAF SPOT (Macrosporium sp.), Washington. NEMATODES in bulbs, Washington. BULB ROT (Penicillium sp.), Washington. RUST (Puccinia iridis) was more prevalent in Mississippi than usual. CROWN ROT (Sclerotium delphinii) on I. xiphium was observed in Connecticut for the first time. MOSAIC (virus) was reported from New York (on German iris), and from Washington.

KALANCHOE COCCINEA. KALANCHOE: POWDERY MILDEW (Sphaerotheca sp.). Plants in greenhouses at New Brunswick, New Jersey, suffered from a very severe attack. ROOT ROT (Thielavia basicola), District of Columbia. A WILT occurred in Camden County, New Jersey. Fusarium sp. and Phytophthora sp. were isolated from brown bundles in the stems.

KALMIA SPP. KALMIA, MOUNTAIN LAUREL: LEAF SPOT (Cercospora kalmiae) caused heavy defoliation in Delaware. LEAF SPOT (Mycosphaerella colorata), Connecticut. BLIGHT (Phomopsis kalmiae), Massachusetts; and on K. latifolia in New York and New Jersey. LEAF SPOT (Phyllosticta kalmicola) on K. latifolia in New Jersey.

KERRIA JAPONICA. KERRIA: BLIGHT (Phoma japonica) was common in Cincinnati, Ohio, associated with dying back of the shoots following winter injury.

LABURNUM VULGARE (L. anagyroides). GOLDENCHAIN: CANKER (Fusarium lateritium (Gibberella baccata)) was reported from New Jersey.

LAGERSTROEMIA SP. Crape Myrtle: POWDERY MILDEW (Erysiphe lagerstroemiae), Florida. SOOTY MOLD (Fumago sp.), District of Columbia on L. indica.

LATHYRUS ODORATUS. SWEET PEA: STREAK (Bacillus lathyri) was severe in a greenhouse at Athens, Georgia. WHITE BLIGHT (Cladosporium album) caused a total loss in one greenhouse in New Jersey where it first appeared two years ago. It was reported from Massachusetts also. POWDERY MILDEW (Erysiphe polygoni), Georgia and Louisiana. ROOT ROT (Fusarium sp.), New York. ANTHRACNOSE (Glomerella cingulata), was very severe in the vicinity of Baton Rouge, Louisiana. Blossom infection was conspicuous. It was also observed in Mississippi. FASCIATION (? bacterial), New York. MOSAIC (virus), Kansas.

LEUCOTHOE CATESBAEI. DROOPING LEUCOTHOE: LEAF SPOT (Pestalotia leucothoe), New Jersey.

LIATRIS SP. Gayfeather: WILT (Verticillium albo-atrum), New Jersey.

LIGUSTRUM SPP. PRIVET: NEMATODE (Aphelenchoides fragariae) was found in stem galls on plants in the District of Columbia. WINTER KILLING was severe in Massachusetts, Rhode Island, Connecticut, New Jersey, and Virginia.

LILIUM SPP. LILY: NEMATODE, Aphelenchoides fragariae, in buds of the Takasago lily, California. (P. D. R. 13: 100). SOFT ROT (Bacillus carotovorus) was reported from Massachusetts, and on Easter Lily, L. longiflorum, from Georgia.

STEM ROT (Botrytis sp.) was much less prevalent in Wisconsin, due to hot dry weather. BLIGHT (Botrytis elliptica) occurred generally in New York in about the usual amount. One serious outbreak caused complete loss in a commercial range of the Madonna lily, L. candidum.

A nearby crop of Easter lily was saved by sanitation and spraying with Bordeaux mixture. (C. Guterman). Botrytis blight was reported from Pennsylvania on Madonna lily, and from Virginia.

STEM ROT (Phytophthora sp.), much less than usual in Wisconsin. ROOT ROT (Phytophthora cactorum) was reported from New Jersey on the regal lily, L. regale. LIMBER NECK, due in part to this organism, occurred in the District of Columbia. STEM ROT (Sclerotium delphinii), New Jersey on the regal lily.

MOSAIC (virus) was prevalent on bulbs of Easter lily and L. speciosum forced by florists in New York. It was present wherever Easter lilies are grown in Louisiana. In the Buras section, where lily bulbs are grown commercially, it was very severe. About 50 per cent of the plants were affected. Mosaic was reported from Florida on Easter lily, and from New Jersey, Mississippi, and Wisconsin.

PIMPLE LEAF (undetermined), New Jersey. WINTER INJURY. Many bulbs of the Madonna lily were killed in the northern part of New York due to the extreme cold of the winter of 1933-34. Most of the plants made poor growth and failed to flower. The foliage was yellow with a purple cast. (C. Guterman).

LOBELIA SP. LOBELIA: STEM ROT (Sclerotium delphinii), New Jersey.

LUPINUS SPP. LUPINE: POWDERY MILDEW (Microsphaera sp.), New Jersey. CHARCOAL ROT (Rhizoctonia bataticola) on L. mutabilis in California. STEM ROT (Rhizoctonia solani), Connecticut.

LYCIUM SP. MATRIMONY VINE: POWDERY MILDEW (Sphaerotheca sp.) Washington.

MAHONIA AQUIFOLIUM. OREGON HOLLYGRAPE: LEAF SPOT (Phyllosticta sp.), New Jersey.

MALUS SPP. FLOWERING CRAB: RUST (Gymnosporangium juniperi-virginianae) was reported from Connecticut on M. ioensis, and from New Jersey, Tennessee, and Georgia. In Athens, Georgia, trees were almost completely defoliated during July. The percentages of infection of various species of Malus in a planting in Knox County, Tennessee, have been recorded in the Reporter (18: 162.).

MATTHIOLA INCANA. COMMON STOCK: ROOT ROT (Corticium vagum), Mississippi.

MYOSOTIS SP. FORGET-ME-NOT: CHLOROSIS. A mild chlorosis, of unknown cause, resembling a mosaic, affected plants in a greenhouse at Athens, Georgia.

NARCISSUS SPP. BULB NEMATODE (Anguillulina dipsaci), Washington. SMOLDER (Botrytis narcissicola), Washington. FIRE (Botrytis polyblastis). The fire disease, which had not been observed in this country previously, appeared in Washington in a limited area in the Puyallup Valley and at Bellingham. The foliage of affected plants was entirely destroyed. A full report of the outbreak is given in the Reporter (18: 51-53). BASAL ROT (Fusarium sp.) was less prevalent than usual in Wisconsin due to dry weather. BLIGHT (Ramularia valisumbrosae), Washington. SOFT ROT (Rhizopus sp.), Washington. SCALE-SPECK FUNGUS (Sclerotium sp.), Washington. LEAF SCORCH (Stagonospora curtisii), Washington. MOSAIC (virus) occurred in New York and New Jersey. COLD WEATHER INJURY was reported from Mississippi.

MERINE SARNIENSIS. GUERNSEY-LILY: LEAF SCORCH (Stagonospora curtisii), North Carolina.

OENOTHERA SP. EVENING PRIMROSE: POWDERY MILDEW (Oidium sp.), New Jersey.

OXALIS SP. OXALIS: RUST (Puccinia sorghi), Mississippi.

PAEONIA SPP. PEONY: BLIGHT (Botrytis paeoniae) was said to be more prevalent in Massachusetts than usual. In most of the other States reporting it, including New York, New Jersey, Wisconsin, and Minnesota, it caused less damage than usual due to dry weather. Ohio reported about the usual amount. LEAF MOLD (Cladosporium herbarum) killed most of the leaves of peonies in a garden in Atlanta, Georgia, in June. LEAF SPOT (Cladosporium paeoniae) was less prevalent than usual in Wisconsin due to dry weather. ROOT KNOT (Heterodera marioni), Wisconsin. BLIGHT (Phytophthora cactorum). Dry weather inhibited the development of this disease in Wisconsin and Minnesota. SOUTHERN BLIGHT (Sclerotium rolfsii), Mississippi. RING SPOT (virus), Wisconsin.

PELARGONIUM SPP. GERANIUM: LEAF SPOT (Alternaria sp.), New Jersey. BLIGHT (Bacterium sp.), New Jersey. BACTERIAL LEAF SPOT (Bacterium erodii), Connecticut. Severe outbreaks of BLIGHT due to Botrytis, cinerea type occurred in several greenhouses in Massachusetts. It was also reported from New Jersey. CUTTING ROT due to Pythium sp., Rhizoctonia sp., and Botrytis cinerea is a serious disease which causes considerable loss to commercial florists in New York. BLACK LEG (Pythium sp.) was reported from New Jersey. LEAF SPOT MOTTLE, apparently due to a virus, which may be the same as the Kräuselkrankheit of Germany, was reported from Washington.

PENSTEMON SPP.: CROWN ROT (Sclerotium delphinii), New Jersey.

PETUNIA HYBRIDA. PETUNIA: DAMPING-OFF (Rhizoctonia solani), New Jersey. MOSAIC (virus), less than usual in Kansas.

PHLOX SPP. PHLOX: POWDERY MILDEW (Erysiphe cichoracearum) was reported from Massachusetts, Connecticut, New York, and New Jersey. RUST (Puccinia plumbaria = Aecidium giliae), Washington. CROWN ROT (Sclerotium delphinii), New Jersey. POWDERY MILDEW (Sphaerotheca pannosa), Washington. WILT (Verticillium sp.), New York.

PHYSOSTEGIA SP. FALSE DRAGONHEAD: CROWN ROT (Sclerotium delphinii), New Jersey.

PODOPHYLLUM PELTATUM. COMMON MAYAPPLE: RUST (Puccinia podophylli), New Jersey.

PYRACANTHA LALANDI. FIRETHORN: BLIGHT (Bacillus amylovorus) in nurseries in Georgia. SCAB (Venturia pyrina pyracanthae), as much as 50 per cent fruit infection was observed in various nurseries in Georgia.

RHODODENDRON SPP. RHODODENDRON. (See also Azalea): New Jersey reported BRANCH BLIGHT (Cytospora sp.), LEAF SPOT (Exobasidium vaccinii) and WHITE LEAF (E. vaccinii-uliginosi) on R. catawbiense, LEAF SPOT (Pestalotia macrotricha), BLIGHT (Phytophthora cactorum), WILT (P. cinnamomi), RUST (Pucciniastrum myrtilli) on R. catawbiense, and LEAF SPOT (Sphaeropsis sp.). WINTER INJURY was severe in Massachusetts.

ROSA SPP. ROSE: CROWN GALL (Bacterium tumefaciens) was less prevalent than usual in Kansas and Wisconsin. In Florida a large proportion of the rose plants dug show crown galls, but they are usually not so situated nor of sufficient size as to cause serious injury. New Jersey and Washington also reported the disease.

CANKERS. BRAND CANKER (Coniothyrium wernsdorffiae) was reported from Mississippi. CANKERS due to Coryneum microstictum and Cryptosporium minimum occurred in Oregon, and to the latter fungus in Pennsylvania also. CROWN CANKER (Cylindrocladium scoparium), New Jersey. BROWN CANKER (Diaporthe umbrina), Massachusetts, New Jersey, Georgia, Mississippi, and Ohio. CANE BLIGHT or CANKER due to Leptosphaeria coniothyrium (Coniothyrium fuckelii) was of moderate importance in Massachusetts, New Jersey, Virginia, Mississippi, and Ohio. CANKER (Tubercularia sp.), in a garden in Maryland.

BLACK SPOT (Diplocarpon rosae) was generally reported as an important disease. Massachusetts reported more than usual. Ohio and Kansas noted less. Twelve States reporting on its prevalence observed about the normal amount. They are New York, New Jersey, the District of Columbia, Tennessee, Georgia, Florida, Mississippi, Louisiana, Arkansas, Wisconsin, Montana, and Washington.

POWDERY MILDEW (Sphaerotheca humuli) was reported as being widespread, but apparently was generally less prevalent than normal as indicated by the following notes: New York, Wisconsin, Kansas, less than usual due to dry weather. Florida, lack of any continuous rainy period and the prevailing rapid air movements probably account in part for the decreased prevalence. The other States reporting its presence are Connecticut, New Jersey, the District of Columbia, Georgia, Mississippi, Arkansas, Ohio, Colorado, and Washington.

DIE-BACK due to various causes, including defoliation from leaf diseases, under-watering during dry seasons, and infections of roots and canes, was very general and important in Florida.

OTHER DISEASES. BUD BLIGHT (Botrytis, cinerea type) caused considerable injury on the buds and young leaves of the Talisman variety in a large forcing house in Michigan. The attack was associated with high humidity and soft growth. The fungus was recorded on rose from Washington also. LEAF SPOT (Cercospora rosicola) was serious on all varieties grown in northern Georgia and occurred in Mississippi also. MUSHROOM ROOT ROT (Clitocybe tabescens) was found frequently in Florida. ROOT-KNOT (Heterodera marioni) is an important disease in Florida. The favorable moisture and temperature and the sandy soils appear to favor its development throughout the year. Cherokee and Texas dog rose are said to be resistant, while R. multiflora, Texas wax rose, and others are susceptible. RUST (Phragmidium sp.), less prevalent than usual in Wisconsin, due to dry weather; also reported from Washington. LEAF SPOT (Phyllosticta sp.), New Jersey. ANTHRACNOSE (Sphaceloma rosarum), Oregon. MOSAIC (virus) was more prevalent than usual in Michigan. In one shipment from California consisting of 20,000 plants about 3 to 5 per cent were affected. In New Jersey, mosaic was observed on Mary Scott roses budded in California. FASCIATION (undetermined), Connecticut. WINTER INJURY was severe in Connecticut, New York, New Jersey, and Virginia.

SEMPERVIVUM SPP. HOUSELEEK, HEN-AND-CHICKENS: LEAF RUST (Endophyllum sempervivi) occurred on a large number of plants of S. tectorum grown in cold-frames by a florist on Staten Island, New York. In a nursery in Iowa a SOFT ROT of unknown origin caused death of the fleshy leaves of the central body, leaving the surrounding buds. Rhizopus sp. was commonly associated.

SENECIO CRUENTUS. CINERARIA: STEM ROT (Sclerotinia sclerotiorum) and WILT (Verticillium sp.) were reported from Washington.

SINNINGIA SPECIOSA. GLOXINIA: STEM ROT (Sclerotinia sclerotiorum), Washington.

SOLIDAGO SPP. GOLDENROD: RUST (Coleosporium solidaginis), common on wild goldenrod in Connecticut. TAR SPOT (Rhytisma solidaginis), New Jersey.

SYMPHORICARPOS SPP. SNOWBERRY: FRUIT ROT (Alternaria sp.), Connecticut. ANTHRACNOSE (Glomerella cingulata) was important in Massachusetts, while in Wisconsin it was less prevalent than usual due to dry weather.

SYRINGA SPP. LILAC: BACTERIAL BLIGHT (Bacterium syringae) was reported from New Jersey, Georgia, and Washington. LEAF BLIGHT (Botrytis cinerea), Washington. LEAF SPOT (Cercospora lilacis), Mississippi. ANTHRACNOSE (Gloeosporium syringae), Connecticut. LEAF SPOT (Phoma sp.), Wisconsin. BLIGHT (Phytophthora cactorum), New Jersey. GRAFT BLIGHT due to uncongenial stock, Massachusetts and Connecticut.

TAGETES SPP. MARIGOLD: A rather severe case of WILT was observed in a commercial planting in Nassau County, New York. Fusarium sp. was the only fungus isolated. YELLOWS (virus) was reported from Connecticut on the African marigold, T. erecta.

TROPAEOLUM MAJUS. NASTURTIUM: ROOT ROT (Corticium vagum), Mississippi.

TULIPA SPP. TULIP: FIRE, BOTRYTIS BLIGHT (Botrytis tulipae) was reported being generally less prevalent than usual; however, it was very severe locally in Virginia. It was reported besides from Massachusetts, New York, New Jersey, Ohio, and Wisconsin. MOSAIC or BREAKING (virus), New York, Arkansas.

VIBURNUM SP. VIBURNUM: DIE-BACK (Phomopsis sp.), New Jersey.

VIBURNUM OPULUS. SNOWBALL: STEM GALL (Phomopsis sp.), New York.

VINCA SPP. PERIWINKLE: CANKER (Phomopsis lirella), on V. minor in New Jersey. RUST (Puccinia vincae), Massachusetts.

VIOLA SPP. VIOLET: SCAB (Sphaceloma violae) was reported from New Jersey, Pennsylvania, and Alabama.

VIOLA TRICOLOR. PANSY: LEAF SPOT (Alternaria sp.), New Jersey. ANTHRACNOSE (Colletotrichum violae-tricoloris) was reported from New Jersey and from Delaware. In the latter State heavy seedling infection occurred in commercial plantings. CURLY TOP (virus) was found on pansy in Oregon (P. D. R. 18: 168-173).

WEIGELA SPP. WEIGELA: ROOT-KNOT (*Heterodera marioni*), Mississippi. The severe weather in December and January caused WINTER INJURY in Connecticut.

YUCCA FILAMENTOSA. COMMON YUCCA: LEAF SPOT (*Coniothyrium concentricum*), New Jersey.

ZANTEDESCHIA AETHIOPICA. CALLA LILY: LEAF SPOT (*Alternaria* sp.), New Jersey. CROWN ROT (*Bacillus aroideae*) was reported from New Jersey and Michigan. In the latter State it was destructive in one greenhouse in October. SOFT ROT reported as due to *B. carotovorus* caused heavy loss in a greenhouse in Georgia. ROOT ROT (*Phytophthora richardiae*) is causing less trouble each year in New York, due perhaps to the fact that corm treatment has become a common practice. SPOTTED WILT (virus), Indiana, Oregon. In Oregon it was found in a greenhouse in Portland where 20 per cent of the plants were affected.

ZINNIA ELEGANS. COMMON ZINNIA: LEAF SPOT (*Cercospora* sp.), New Jersey. POWDERY MILDEW (*Erysiphe cichoracearum*) was very severe in one county in North Dakota and was reported also from New Jersey and Kansas. STEM ROT (*Sclerotinia sclerotiorum*), Massachusetts and Washington. CROWN ROT (*Sclerotium delphinii*), New Jersey. MOSAIC (virus) caused less damage than usual in Kansas. PROLIFERATION (undetermined), in which the flower petals changed to bracts, was reported from Connecticut.

INDEX OF ORGANISMS AND NON-PARASITIC DISEASES

Prepared by Nellie W. Nance.

A

- Abnormality, wheat, 20.
- Acanthorhynchus vaccinii, cranberry, 55.
- Actinomyces sp., sweet potato, 70.
- scabies, beet, 85.
- potato, 59.
- radish, 75.
- rutabaga, 75.
- Aecidium giliae, Phlox spp., 116.
- Albinism (physiological), alfalfa, 33.
- Albugo candida, horseradish, 74.
- radish, 75.
- ipomoeae-panduratae, sweet potato, 70.
- tragopogonis, salsify, 88.
- Aleurodiscus acerinus, Quercus virginiana, 104.
- Alternaria sp., asparagus, 84.
- beet, 85.
- broccoli, 74.
- Celosia sp., 108.
- collards, 74.
- Dianthus caryophyllus, 110.
- parsley, 86.
- Pelargonium spp., 115.
- pepper, 87.
- Symphoricarpos spp., 118.
- tobacco, 92.
- Viola tricolor, 118.
- Zantedeschia aethiopica, 119.
- brassicae, cabbage, 73.
- cauliflower, 73.
- herculea, turnip, 75.
- radicina, carrot, 86.
- solani, eggplant, 86.
- pepper, 87.
- potato, 59.
- tomato, 64.
- Anguillulina dipsaci, Chrysanthemum leucanthemum, 109.
- Narcissus spp., 115.
- soybean, 37.
- Trifolium arvense, 34.
- Trifolium repens, 34.
- pratensis, potato, 61.
- tritici, wheat, 20.
- Aphanomyces euteiches, pea, 83.
- Aphelenchoides fragariae, Begonia spp., 107.
- Chrysanthemum hortorum, 108.
- Ligustrum spp., 113.
- strawberry, 51.
- Takasago lily, 113.
- ritzema-bosi, see Aphelenchoides fragariae.
- Aplanobacter insidiosum, alfalfa, 31.
- michiganense, tomato, 65.
- stewarti, corn, 28.
- sweet corn, 30.
- Armillaria mellea, blackberry, 54.
- cherry, 48.
- citrus, 56.
- filbert, 58.
- peach, 45.
- pear, 44.
- Quercus spp., 104.
- Asochyta spp., pea, 84.
- clematidina, Clematis, spp., 109.
- gossypii, cotton, 94.
- juglandis, Persian walnut, 57.
- meliloti, Melilotus indica, 35.
- pinodella, Austrian winter pea, 36.
- pisi, Austrian winter pea, 35.
- pea, 84.
- vetch, 37.
- rhei, rhubarb, 88.

Aspergillus, corn, 27.
niger, onion, 71.

B

Bacillus sp., radish, 75.
amylovorus, *Amelanchier alnifolia*, 106.
apple, 40.
Cotoneaster spp., 109.
Crataegus oxyacantha, 103.
pear, 43.
Pyracantha lalandi, 116.
quince, 44.
Sorbus americana, 104.
aroideae, *Zantedeschia aethiopica*, 119.
carotovorus, cabbage, 73.
carrot, 86.
cauliflower, 74.
celery, 82.
horseradish, 74.
Iris spp., 112.
Lilium longiflorum, 113.
onion, 71.
turnip, 75.
Zantedeschia aethiopica, 119.
lathyri, *Lathyrus odoratus*, 113.
phytophthorus, potato, 59.
tracheiphilus, cantaloupe, 76.
cucumber, 77.
pumpkin, 78.
squash, 78.
watermelon, 79.
Bacteria, pea, 84.
Bacterial leaf spot, *Berberis thunbergii*, 107.
Coleus spp., 109.
Bacterium sp., *Corylus californica*, 58.
Corylus colurna, 58.
filbert, 58.
Pelargonium spp., 115.
turnip, 75.
spp. bean, 67.
angulatum, tobacco, 91.
atrofaciens, wheat, 19.
campestre, broccoli, 74.
cabbage, 72.

Bacterium campestre, cauliflower, 73.
kale, 74.
turnip, 75.
cannae, *Canna indica*, 108.
citriputeale, see *B. syringae*.
coronafaciens, oats, 25.
cucurbitae, squash, 79.
delphinii, *Delphinium* spp., 110.
dissolvens, corn, 28.
erodii, *Pelargonium* spp., 115.
flaccumfaciens, bean, 67.
gummisudans, *Gladiolus* sp., 111.
gypsophilae, *Gypsophila paniculata*, 111.
hederae, *Hedera helix*, 111.
juglandis, *Juglans sieboldiana*, 57.
Persian walnut, 57.
lachrymans, cucumber, 78.
maculicolum, cabbage, 73.
cauliflower, 73.
malvacearum, cotton, 93.
marginatum, *Gladiolus* sp., 111.
medicaginis phaseolicola, bean, 67.
mori, mulberry, 49.
phaseoli, bean, 67.
cowpea, 35.
lima bean, 69.
phaseoli sojense, soybean, 36.
pisi, Austrian winter pea, 36.
pea, 83.
pruni, cherry, 48.
peach, 45.
plum, 47.
sojae, soybean, 36.
solanacearum, *Dahlia* spp., 109.
potato, 61.
tobacco, 91.
syringae, citrus, 56.
Syringa spp., 118.
see also *B. vignae*.
tabacum, tobacco, 91.
translucens, barley, 23.
translucens undulosum, wheat, 19.
tumefaciens, apple, 41.
blackberry, 54.
Elaeagnus sp., 110.
plum, 47.
quince, 44.

- Bacterium tumefaciens*, raspberry, 52.
 Rosa spp., 116.
 vesicatorium, tomato, 65.
 vignae, bean, 67.
 lima bean, 69.
 woodsii, *Dianthus caryophyllus*, 110.
Basisporium gallarum, corn, 27, 28.
 Bitter pit (non-par.), apple, 41.
 Black-end, pear, 44.
 Black heart (non-par.) celery, 81.
 Black pod spot (undet.), pea, 84.
 Black root, strawberry, 50.
 Black speck (suboxidation), cabbage, 73.
 Blast (undet.), oats, 26.
 Blight (undet.), watercress, 75.
 Blossom-end rot (non-par.), pepper, 87.
 tomato, 65.
 Blotchy ripening, tomato, 67.
Botryosphaeria berengeriana, pecan, 58.
 ribis; *Ulmus parviflora*, 104.
Botrytis, pear, 44.
Botrytis, sp., *Begonia* spp., 107.
 blueberry, 55.
 Cornus spp., 103.
 Cyclamen persicum, 109.
 Dahlia spp., 109.
 Delphinium spp., 110.
 Dianthus caryophyllus, 110.
 Iris spp., 112.
 Lilium spp., 113.
 onion, 71.
Botrytis spp., cowpea, 35.
 allii, onion, 71.
 blight, Madonna lily, 114.
 cinerea, *Alnus* sp., 102.
 asparagus, 84.
 Azalea pontica, 107.
 bean, 68.
 blackberry, 54.
 celery, 82.
 Gerbera jamesoni, 111.
 lettuce, 83.
 pea, 84.
 Pelargonium spp., 115.
 pepper, 87.
 potato, 61.
 Rosa spp., 117.
 strawberry, 50.
 Syringa spp., 118.
Botrytis cinerea, tomato, 66.
 convoluta, *Iris* spp., 112.
 elliptica, *Lilium* spp., 113.
 Lilium candidum, 113.
 narcissicola, *Narcissus* spp., 115.
 paeoniae, *Paeonia* spp., 115.
 polyblastis, *Narcissus* spp., 115.
 tulipae, *Tulipa* spp., 118.
 Breakdown, potato, 63.
 Breaking (virus), *Tulipa* spp., 118.
Bremia lactucae, lettuce, 83.
 Bronzed wilt, potato, 63.
 Brown rot (non-par.), cauliflower, 74.
 Brown-stain (non-par.), filbert, 58.
 Bud drop, *Gardenia florida*, 111.
- C
- Calico, potato, 62
 Canker, willow, 99.
Cephalosporium sp., elm, 100.
 Ulmus spp., 104.
 acremonium, corn, 28.
Ceratostomella fimbriata, sweet
 potato, 69.
 ulmi, elm, 99, 100.
 Ulmus spp., 104.
Cercospora sp., *Hydrangea* spp., 112.
 peanut, 95.
 Zinnia elegans, 119.
Cercospora spp., clover, 34.
 cowpea, 35.
 althaeina, *Althaea rosea*, 106.
 apii, celery, 80.
 apii carotae, carrot, 85.
 arachidicola, peanut, 95.
 beticola, beet, 85.
 spinach, 89.
 sugar beet, 96.
 swiss chard, 89.
 bloxami, cabbage, 73.
 caulicola, asparagus, 84.
 cruenta, bean, 68.
 destructiva, *Euonymus* spp., 111.
 diazu, soybean, 36.
 fusca, pecan, 58.
 kalmiae, *Kalmia* spp., 113.
 lilacis, *Syringa* spp., 118.
 medicaginis, alfalfa, 33.

- Cercospora musarum*, banana, 56.
nicotianae, tobacco, 91.
pastinacae, parsnip, 86.
personata, peanut, 95.
rosicola, *Rosa* spp., 117.
rubi, blackberry, 53.
Cercospora sp., blackberry, 54.
herpotrichoides, wheat, 19.
Chlorosis; bean, 69.
Myosotis sp., 114.
spinach, 89.
Cladosporium, pear, 44.
album; *Lathyrus odoratus*, 113.
pea, 84.
carpophilum, peach, 45.
plum, 48.
cucumerinum, cantaloupe, 76.
cucumber, 78.
squash, 79.
cyclaminis, *Cyclamen persicum*, 109.
effusum, pecan, 57.
epiphyllum, cottonwood, 103.
fulvum, tomato, 66.
herbarum, *Paeonia* spp., 115.
herbarum nodosum, *Dianthus caryophyllus*, 110.
paeoniae, *Paeonia* spp., 115.
pisicolum, pea, 84.
vignae, cowpea, 35.
Claviceps paspali, *Paspalum* spp., 38.
purpurea, barley, 23.
rye, 21.
wheat, 20.
Clitocybe tabescens, *Rosa* spp., 117.
Coccomyces hiemalis, cherry, 48.
prunophorae, plum, 48.
Cold weather injury, *Narcissus* spp., 115.
Coleosporium solidaginis, *Aster frikartii*, 106.
Callistephus chinensis, 107.
Solidago spp., 118.
Collar rot, pear, 44.
Colletotrichum sp., *Althaea rosea*, 106.
antirrhini, *Antirrhinum majus*, 106.
circinans, onion, 71.
falcatum, sugar cane, 95.
fragariae, strawberry, 50.
Colletotrichum gloeosporioides, *Citrus taitensis*, 109.
graminicolum, rye, 21.
wheat, 20.
higginsianum, turnip, 75.
lagenarium, cantaloupe, 76.
cucumber, 78.
watermelon, 80.
lindemuthianum, bean, 67.
lima bean, 69.
lineola, sorghum, 30.
nigrum, pepper, 87.
phomoides, tomato, 67.
pisi, pea, 84.
pollacii, *Acuba japonica aurea*, 106.
spinaciae, spinach, 89.
trifolii, clover, 34.
truncatum, lima bean, 69.
violae-tricoloris, *Viola tricolor*, 118.
Collybia velutipes, *Ulmus* spp., 104.
Coniothyrium sp., *Ulmus* spp., 104.
concentricum, *Yucca filamentosa*, 119.
fuekelii, see *Leptosphaeria coniothyrium*.
wernsdorffiae, *Rosa* spp., 116.
Corky outgrowth, *Begonia* spp., 107.
Corticium sp., live oak, 104.
koleroga, fig, 57.
koleroga, pear, 43.
salmonicolor, fig, 57.
stevensii, *Aleurites fordii*, 102.
apple, 41.
vagum, bean, 68.
cabbage, 72.
carrot, 86.
cauliflower, 73.
celery, 82.
cotton, 93.
lettuce, 82.
Matthiola incana, 114.
pea, 83.
potato, 60.
sugar beet, 96.
Tropaeolum majus, 118.
Coryneum microstictum, *Rosa* spp., 116.
Crack-neck, *Chrysanthemum hortorum*, 109.
Gladiolus sp., 111.

- Crack stem (non-par.), celery, 81.
 Cracking, grape, 49.
 Crinkle (virus), strawberry, 51.
 Cronartium ribicola, Pinus spp., 105.
 white pine, 101.
 Cryptosporium minimum, Rosa spp., 116.
 Curly dwarf, potato, 62.
 Curly top (virus), bean, 68.
 beet, 85.
 cantaloupe, 76.
 cucumber, 78.
 eggplant, 86.
 pansy, 118.
 pepper, 87.
 squash, 79.
 sugar beet, 96.
 swiss chard, 89.
 tobacco, 90.
 tomato, 66.
 Cylindrocladium scoparium, Rosa spp., 116.
 Cylindrosporium chrysanthemi, Chrysanthemum hortorum, 109.
 Cytospora sp., Acer platanoides, 102.
 Rhododendron spp., 116.
 chrysosperma, Populus spp., 103.
 Populus bolleana, 103.
 Salix spp., 104.
 Salix babylonica, 104.
 Salix discolor, 104.
 willow, 99.
 Cytosporina ludibunda, Ulmus spp., 104.
- D
- Damping-off, carrot, 85.
 spinach, 89.
 sugar beet, 97.
 Dark center (non-par.) rutabaga, 75.
 Darluca filum, Puccinia graminis
 avenae, 24.
 Deficiency disease (non-par.) cantaloupe, 77.
 Dendrophoma obscurans, strawberry, 50.
 Diaporthe citri, citrus, 56.
 crotalariae, Crotalaria spectabilis, 37.
 phaseolorum, lima bean, 69.
 Diaporthe sojae, soybean, 36.
 umbrina, Rosa spp., 116.
 Didymella applanata, raspberry, 52.
 Didymella iridis, Iris spp., 112.
 macrospora, Iris spp., 112.
 Die-back, apple, 42.
 Robinia pseudoacacia, 104.
 Rosa spp., 117.
 willow, 99.
 Diplocarpon earliana, strawberry, 50.
 rosae, Rosa spp., 116.
 Diplodia, corn, 27.
 sweet corn, 30.
 Diplodia sp., strawberry, 51.
 frumenti, corn, 28.
 gossypina, cotton, 94.
 longispora, Quercus montana, 104.
 macrospora, corn, 28.
 natalensis, peanut, 95.
 zeae, corn, 27, 28.
 Disease complex, strawberry, 51.
 Dothichiza populea, Populus spp., 103.
 Populus bolleana, 103.
 Drought injury, apple, 42.
 celery, 82.
 corn, 29.
 cotton, 94.
 grape, 49.
 pea, 84.
 peach, 47.
 rye, 21.
 sugar beet, 96, 97.
 sweet potato, 70.
 tomato, 67.
 Drought spot (physiological), tobacco, 92.
 Dust injury, bean, 69.
 Dwarf (cause unknown), alfalfa, 33.
 Dying, Thuja spp., 105.
- E
- Ear rot, sweet corn, 30.
 Elsinoe ampelina, grape, 49.
 phaseoli, lima bean, 69.
 veneta, dewberry, 54.
 raspberry, 52.
 Endoconidiophora fimbriata, Platanus spp. 103.

Endoconidiophora fimbriata, sycamore, 98.
Endophyllum sempervivi, *Sempervivum*
tectorum, 117.
Endothia parasitica, *Castanea* spp.,
 103.
 chestnut, 97.
Entomosporium maculatum, *Betula* spp.,
 103.
thuemenii, *Crataegus oxyacantha*,
 103.
Erysiphe sp., *Tilia americana*, 104.
cichoracearum, *Chrysanthemum*
hortorum, 109.
Phlox spp., 116.
 pumpkin, 78.
 squash, 79.
 sunflower, 39.
Zinnia elegans, 119.
graminis, barley, 23.
 oats, 25.
 wheat, 20.
lagerstroemiae, *Lagerstroemia* sp.,
 113.
polygoni, Austrian winter pea, 36.
 bean, 68.
 cantaloupe, 76.
 clover, 34.
 cowpea, 35.
 cucumber, 78.
Dahlia spp., 109
Delphinium spp., 110
Lathyrus odoratus, 113.
 pea, 84.
Trifolium dubium, 34.
Trifolium pratense, 34.
Trifolium reflexum, 34.
Exoascus communis, plum, 47.
deformans, flowering peach, 106.
 peach, 44.
mirabilis, plum, 47.
Exobasidium sp., *Azalea* spp., 107.
vaccinii, *Azalea hinodegiri*, 107.
Azalea indica, 107.
Rhododendron spp., 116.
vaccinii-uliginosi, *Rhododendron*
catawbiense, 116.
Exosporium concentricum, *Euonymus*
japonicus, 111.

F

Fabraea maculata, pear, 43.
 quince, 44.
 False blossom (virus), cranberry, 55.
 Fasciation, asparagus, 85.
 horseradish, 74.
Lathyrus odoratus, 113.
Rosa spp., 117.
 sweet potato, 70.
 Fern-leaf, tomato, 66.
 Fire, *Iris tingitana*, 112.
Iris xiphium, 112.
Fistulina hepatica, *Quercus* spp., 104.
 Floret sterility, wheat, 20.
 Flower spot, *Azalea* spp., 107.
 Freckle spot, Persian walnut, 57.
 Frenching (non-par.), tobacco, 92.
 Frost injury, *Acer* spp., 102.
Aesculus sp., 102.
 apple, 42.
 wheat, 20.
 Fruit freckle, banana, 56.
 Fruit rots, tomato, 66.
Fuligo septica, grass, 38.
 strawberry, 51.
Fumago sp., *Lagerstroemia indica*, 113.
Fumago vagans, pear, 44.
Fusarium, corn, 27, 28.
 potato, 63.
 tobacco, 91.
Fusarium sp., *Antirrhinum majus*, 106.
 asparagus, 84.
Asparagus asparagoides, 106.
Azalea spp., 107.
 bean, 68.
Callistephus chinensis, 107.
 cantaloupe, 76.
 celery, 81.
Chrysanthemum hortorum, 109.
 cotton, 94.
Freesia spp., 111.
Gladiolus sp., 111.
 horseradish, 74.
Kalanchoe coccinea, 112.
Lathyrus odoratus, 113.
Morus alba, 49.
Narcissus spp., 115.

- Fusarium* sp., pea, 83, 84.
 Tagetes spp., 118.
 tomato, 66.
 Ulmus spp., 104.
Fusarium spp., barley, 24.
 corn, 27.
 lima bean, 69.
 oats, 25.
 onion, 71.
 potato, 60, 61.
 squash, 79.
 wheat, 19.
 batatis, sweet potato, 69.
 conglutinans, cabbage, 72.
 conglutinans, cauliflower, 74.
 conglutinans callistephi, *Callistephus chinensis*, 107.
Fusarium cubense, banana, 56.
Fusarium dianthi, *Dianthus caryophyllus*, 110.
 eumartii, potato, 60, 61, 63.
 hyperoxysporum, sweet potato, 69.
 lateritium, *Laburnum vulgare*, 113.
 lini, flax, 31.
 lycopersici, tomato, 63.
 martii phaseoli, bean, 68.
 cowpea, 35.
 martii pisi, pea, 83.
 moniliforme, corn, 27, 28.
 nivale, grass, 38.
 niveum, watermelon, 79.
 orthoceras pisi, pea, 83.
 oxysporum, potato, 60.
 oxysporum nicotianae, tobacco, 91.
 vasinfectum, cotton, 93.
 vasinfectum tracheiphilum, cowpea, 35.
Fusicladium saliciperdum, *Salix* spp., 104.
 willow, 99.
Fusisporium rubi, blackberry, 53.
 dewberry, 54.
 raspberry, 53.

G

- Giant hill, potato, 62.
Gibberella, corn, 27, 28.
Gibberella baccata, see *Fusarium lateritium*.

- Gibberella moniliformis*, corn, 28.
 saubinetii, barley, 23.
 corn, 26, 27.
 oats, 25.
 rye, 21.
 wheat, 18.
Gibellina cerealis, *Holcus lanatus*, 19.
 oats, 25.
 spelt, 19.
 wheat, 19.
Gloeodes pomigena, apple, 41.
Gloeosporium, pear, 44.
Gloeosporium sp., *Acer saccharum*, 102.
 Camellia japonica, 108.
 Farfugium grande, 111.
 Gerbera jamesoni, 111.
 Salix spp., 104.
 apocryptum, Norway maple, 102.
 coryli, *Corylus californica*, 58.
 liriodendri, *Liriodendron tulipifera*, 103.
 musarum, banana, 56.
 saccharini, *Acer* spp., 102.
 syringae, *Syringa* spp., 118.
Glomerella cingulata, apple, 40.
 fig, 57.
 Lathyrus odoratus, 113.
 pepper, 87.
 Symphoricarpos spp., 118.
 cingulata vaccinii, blueberry, 55.
 cranberry, 55.
 gossypii, cotton, 92.
Gnomonia ulmea, *Ulmus* spp., 104.
 veneta, *Platanus occidentalis*, 103.
 Quercus spp., 104.
Godronia cassandrae, cranberry, 55.
 Graft blight, *Syringa* spp., 118.
 Granulation, citrus, 56.
 Growth cracks, apple, 42.
Guignardia aesculi, horse chestnut, 102.
 bidwelli, grape, 49.
 vaccinii, cranberry, 55.
 Gummosis, peach, 47.
Gymnoconia peckiana, blackberry, 53.
 dewberry, 54.
 raspberry, 52.
Gymnosporangium spp., apple, 40.
 clavipes, apple, 40.
 Crataegus oxyacantha, 103.
 quince, 44.

Gymnosporangium ellisii, *Chamaecyparis*
 thyoides, 105.
globosum, apple, 40.
 Crataegus oxyacantha, 103.
 pear, 43.
juniperi-virginianae, *Crataegus*
 spp., 103.
 Malus ioensis, 114.
 red cedar, 105.
Hail injury, grape, 49.
 tobacco, 92.
Haywire, potato, 63.
Heat canker (non-par.), flax, 31.
Heat injury, celery, 82.
 cantaloupe, 77.
 rye, 21.
Helminthosporium sp., crabgrass, 38.
 grass, 38.
Helminthosporium spp., barley, 24.
 avenae, oats, 26.
 gramineum, barley, 22.
 grass, 38.
 oryzae, rice, 31.
 papulosum, pear, 44.
 sativum, barley, 22.
 wheat, 19.
 turcicum, corn, 28.
 vagans, grass, 38.
 Poa pratensis, 38.
Hendersonia subalbicans, *Camellia*
 japonica, 108.
Heterodera marioni, *Antirrhinum*
 majus, 106.
 apple, 42.
 bean, 69.
 beet, 85.
 carrot, 86.
 celery, 81.
 cotton, 94.
 cowpea, 35.
 Gardenia florida, 111.
 onion, 71.
 Paeonia spp., 115.
 pepper, 87.
 potato, 61.
 Rosa spp., 117.
 sweet potato, 70.
 tobacco, 91.
 tomato, 67.

Heterodera marioni, *Weigela* spp., 119.
 schachtii, sugar beet, 97.
Heterosporium echinulatum, *Dianthus*
 caryophyllus, 110.
 gracile, see *Didymellina*
 macrospora.
Hopper injury, 34.
 cowpea, 35.
Hopperburn, potato, 62.
Hydnum omnivorum, cotton, 94.

I

Infectious chlorosis (virus), apple, 42.
Internal brown spot, potato, 63.
Internal browning, apple, 42.
Internal cork, apple, 42.

K

Keithia tsugae, *Tsuga canadensis*, 105.
Kuehneola uredinis, dewberry, 54.

L

Leaf blight, Persian walnut, 57.
Leaf blight (bacterial), corn, 28.
Leaf blight (frost injury),
 Aesculus spp., 102.
Leaf bronzing (non-par.), hops, 94.
Leaf cast (undet.), Juniper, 105.
Leaf crinkling, *Dahlia* spp., 110.
Leaf curl (virus), raspberry, 53.
Leaf drop, *Gardenia florida*, 111.
Leaf roll (non-par.), pepper, 87.
Leaf roll (virus), potato, 61.
Leaf scorch, Norway maple, 102.
Leaf scorch, sugar maple, 102.
Leaf spot, *Azalea pontica*, 107.
 Cornus spp., 103.
 Ilex spp., 112.
Leaf spot (frost injury), *Acer* spp., 102.
Leaf spot mottle, *Pelargonium* spp., 115.
Leaf variegation, strawberry, 51.
Leak, potato, 63.
Leptosphaeria coniothyrium, dewberry, 54.
 raspberry, 53.
 Rosa spp., 116.
 salvinii, rice, 31.

Leptothyrium pomi, apple, 41.
 Lightning injury, cotton, 94.
 pepper, 87.
 Limber neck, Liliun spp., 114.
 Little plum (virus), plum, 48.
 Littles (virus), peach, 45.

M

Macrophoma sp., Ulmus spp., 104.
 candollei, Buxus spp., 107.
 Buxus sempervirens suffruticosa, 107.
 Macrosporium sp., Dahlia spp., 110.
 Iris spp., 112.
 onion, 71.
 carotae, carrot, 85.
 cucumerinum, cantaloupe, 76.
 cucumber, 78.
 squash, 79.
 parasiticum, onion, 71.
 porri, onion, 71.
 Marginal necrosis (frost injury), Acer spp., 102.
 Marssonina juglandis, Hicoria spp., 103.
 Marssonina sp., silver poplar, 103.
 Salix spp., 104.
 Massaria platani, Platanus occidentalis, 103.
 Measles, apple, 42.
 Melampsora abietis-canadensis, Tsuga canadensis, 105.
 lini, flax, 31.
 Linum lewisii, 31.
 occidentalis, cottonwood, 103.
 Melanconium fuligineum, grape, 49.
 Microsphaera sp., Lupinus spp., 114.
 alni, Azalea spp., 107.
 pecan, 58.
 Quercus alba, 104.
 Microstroma brachysporum, Persian walnut, 57.
 Monilochaetes infuscans, sweet potato, 70.
 Monochaetia camelliae, Camellia japonica, 108.
 Moron, potato, 63.
 Mosaic (undet.), sweet potato, 70.
 Mosaic (virus), alfalfa, 33.

Mosaic (virus), bean, 68.
 blackberry, 54.
 cantaloupe, 76.
 celery, 82.
 clover, 34.
 corn, 28.
 cowpea, 35.
 Crotalaria sp., 37.
 cucumber, 77.
 Dahlia spp., 110.
 eggplant, 86.
 Easter lily, 114.
 German iris, 112.
 Lathyrus odoratus, 113.
 Lilium speciosum, 114.
 lily, 114.
 Narcissus spp., 115.
 onion, 71.
 pea, 84.
 peach, 46.
 pepper, 87.
 Petunia hybrida, 115.
 potato, 62.
 pumpkin, 78.
 raspberry, 53.
 Rosa spp., 117.
 rutabaga, 75.
 soybean, 36.
 spinach, 89.
 squash, 79.
 strawberry, 51.
 sugar cane, 95.
 sweet clover, 34.
 tobacco, 90.
 tomato, 66.
 Tulipa spp., 118.
 turnip, 75.
 Zinnia elegans, 119.
 crinkle, potato, 62.
 mild, potato, 62.
 rugose, potato, 62.
 southern celery, celery, 82.
 squash, 79.
 Mottle leaf (malnutrition), citrus, 56.
 Mycosphaerella citrullina, cantaloupe, 76.
 cucumber, 77.
 pumpkin, 78.
 squash, 79.

Mycosphaerella citrullina, water-melon, 80.
colorata, *Kalmia* spp., 113.
fragariae, strawberry, 50.
grossulariae, gooseberry, 54.
lethalis, sweet clover, 34.
pinodes, Austrian winter pea, 35.
 pea, 84.
pomi, apple, 41.
rubi, blackberry, 53.
 dewberry, 54.
 raspberry, 52.
sentina, pear, 43.

N

Necrosis, *Dahlia* spp., 110.
Nectria sp., *Tilia americana*, 104.
cinnabarina, *Acer palmatum*, 102.
Aesculus spp., 102.
Aleurites cordata, 102.
galligena, *Betula* spp., 103.
rousseliana, *Buxus* spp., 107.
Buxus sempervirens suffruticosa, 107.
Nematospora lycopersici, tomato, 66.
Neofabraea malicorticis, apple, 41.
 Net necrosis, potato, 63.

O

Oedema, cabbage, 73.
 lima bean, 69.
Lycopersicum pimpinellifolium
 x *L. esculentum*, 67.
 sweet potato, 70.
Oidium sp., *Calendula officinalis*, 107.
Hydrangea spp., 112.
Oenothera sp., 115.
euonymi-japonici, *Euonymus* spp., 111.
Euonymus japonicus, 111.
Ophiobolus graminis, wheat, 20.

P

Penicillium, corn, 27.
 pear, 44.
Penicillium sp., *Iris* spp., 112.
 Persian walnut, 57.

Penicillium spp., corn, 27.
 onion, 71.
 squash, 79.
gladioli, *Gladiolus* sp., 111.
glaucum, *Citrus* sp., 109.
Peronospora destructor, onion, 70.
effusa, spinach, 88.
parasitica, cabbage, 72.
 cauliflower, 73.
 radish, 75.
 turnip, 75.
pisi, pea, 84.
schleideni, see *P. destructor*.
tabacina, tobacco, 89.
trifoliorum, alfalfa, 32.
Pestalotia aucubae, *Aucuba japonica*
aurea, 106.
cibotii, *Cibotium schiedei*, 109.
guepini, *Camellia japonica*, 108.
leucothoe, *Leucothoe catesbaei*,
 113.
macrotricha, *Rhododendron* spp., 116.
Phlyctaena linicola, flax, 31.
Phoma sp., *Buxus* spp., 107.
Syringa spp., 118.
Ulmus spp., 104.
apiicola, celery, 82.
betae, sugar beet, 96.
destructiva, pepper, 87.
 tomato, 66.
japonica, *Kerria japonica*, 113.
lingam, broccoli, 74.
 brussels sprouts, 74.
 cabbage, 72.
 cauliflower, 74.
medicaginis, alfalfa, 32.
terrestris, leek, 86.
 onion, 71.
zeicola, corn, 28.
Phomopsis sp., *Azalea* spp., 107.
Gardenia florida, 111.
 Japanese maple, 102.
Sorbus americana, 104.
Taxus hicksii, 105.
Tsuga canadensis, 105.
Ulmus spp., 105.
Viburnum sp., 118.
Viburnum opulus, 118.
californica, see *Diaporthe citri*.

Phomopsis callistephi, *Callistephus chinensis*, 108.

citri, see *Diaporthe citri*.

juniperovora, red cedar, 105.

kalmiae, *Kalmia latifolia*, 113.

lirella, *Vinca minor*, 118.

vexans, eggplant, 86.

Phony peach (virus), peach, 46.

Phragmidium sp., *Rosa* spp., 117.

imitans, see *P. rubi-idaei*, 52.

rubi-idaei, raspberry, 52.

Phyllachora trifolii, clover, 34.

vulgata, *Muhlenbergia schreberi*, 38.

Phyllactinia corylea, *Corylus californica*, 58.

filbert, 58.

Phyllosticta sp., *Althaea rosea*, 106.

Begonia spp., 107.

Celosia sp., 108.

Ilex opaca, 112.

lemon, 56.

Mahonia aquifolium, 114.

Quercus spp., 104.

Rosa spp., 117.

antirrhini, *Antirrhinum majus*, 106.

aristolochiae, *Aristolochia* sp., 106.

catalpae, *Catalpa bungei*, 103.

concentrica, *Hedera helix*, 111.

Hydrangeae, *Hydrangea* spp., 112.

kalmicola, *Kalmia latifolia*, 113.

liriodendrica, *Liriodendron tulipifera*, 103.

minima, silver maple, 102.

solitaria, apple, 39.

straminella, rhubarb, 88.

Phymatotrichum omnivorum, *Acer* spp., 102.

Acer negundo, 102.

cotton, 93.

Physalospora miyabeana, *Salix* spp., 104.

willow, 99.

obtusa, apple, 40.

Physarum cinereum, grass, 38.

Physiological disorders, soybean, 37.

Physoderma zeae-maydis, corn, 28.

Physopella fici, fig, 57.

Phytomonas apii, celery, 82.

Phytophthora, *Hyacinthus* spp., 111.

Kalanchoe coccinea, 112.

Lilium spp., 114.

Phytophthora sp., rhubarb, 88.

cactorum, *Lilium regale*, 114.

Paeonia spp., 115.

Rhododendron spp., 116.

Syringa spp., 118.

capsici, pepper, 87.

cinnamomi, Norway spruce, 101.

Picea spp., 105.

Pinus spp., 105.

Quercus spp., 104.

red oak, 101.

red pine, 101.

Rhododendron spp., 116.

citrophthora, citrus, 56.

infestans, potato, 59.

tomato, 65.

palmivora, coconut, 58.

parasitica, black locust, 99.

Robinia pseudoacacia, 104.

parasitica nicotianae, tobacco, 91.

parasitica rhei, rhubarb, 88.

phaseoli, lima bean, 69.

richardiae, *Zantedeschia aethiopica*, 119.

terrestris, tomato, 65.

Pimple leaf (undet.), *Lilium* spp., 114.

Piricularia grisea, crabgrass, 38.

rice, 31.

Plasmodiophora brassicae, cabbage, 72.

cauliflower, 73.

kale, 74.

kohl rabi, 75.

radish, 75.

Plasmopara viticola, grape, 49.

Vitis californica, 49.

Plectodiscella veneta, see *Elsinoe*

veneta.

Plenodomus destruens, sweet potato, 70.

Pleurococcus sp., *Ilex* spp., 112.

Pleurotus ulmarius, *Ulmus* spp., 105.

Plowrightia morbosa, plum, 47.

Podosphaera leucotricha, apple, 41.

oxyacanthae, peach, 45.

Polyporus sp., *Betula nigra*, 103.

graveolens, *Quercus velutina*, 104.

sulphureus, black oak, 104.

Polystictus conchifer, *Ulmus* spp., 105.

Potash hunger, cotton, 94.

tobacco, 92.

Proliferation (undet.), *Zinnia elegans*, 119.

Pseudoperonospora cubensis, cantaloupe, 77.
 cucumber, 77.
 squash, 79.
 watermelon, 80.
 humuli, hops, 94.
Pseudopeziza medicaginis, alfalfa, 32.
 ribis, currant, 54.
 gooseberry, 54.
Psorosis (virus), citrus, 56.
Psyllid yellows, potato, 63.
Puccinia anomala, barley, 22.
 antirrhini, *Antirrhinum majus*, 106.
 asparagi, asparagus, 84.
 caricis, gooseberry, 54.
 chrysanthemi, *Chrysanthemum hortorum*, 109.
 coronata, oats, 25.
 dispersa, see *Puccinia rubigo-vera secalis*.
 glumarum, *Agropyron cristatum*, 38.
 wheat, 18.
 graminis, *Agrostis alba*, 38.
 Phleum pratense, 38.
 graminis avenae, oats, 24.
 graminis secalis, rye, 20.
 graminis tritici, barley, 22.
 wheat, 17.
 helianthi, *Helianthus annuus*, 39.
 sunflower, 39.
 iridis, *Iris* spp., 112.
 malvacearum, *Althaea rosea*, 106.
 plumbaria, *Phlox* spp., 116.
 podophylli, *Podophyllum peltatum*, 116.
 purpurea, *Sorghum halepense*, 38.
 rubigo-vera, *Clematis* spp., 109.
 rubigo-vera secalis, rye, 21.
 rubigo-vera tritici, wheat, 18.
 sorghii, corn, 26.
 Oxalis sp., 115.
 sweet corn, 29.
 trititica, see *P. rubigo-vera tritici*.
 vincae, *Vinca* spp., 118.
Pucciniastrum americanum, raspberry, 52.
 myrtilli, *Rhododendron catawbiense*, 116.
Pyrenopeziza medicaginis, alfalfa, 33.

Pyrenophora teres, barley, 23.
Pythium sp., *Agrostis* spp., 38.
 beet, 85.
 cucumber, 78.
 lettuce, 83.
Pelargonium spp., 115.
 pepper, 87.
 spinach, 89.
 tobacco, 91.
 tomato, 66.
Pythium spp., alfalfa, 32.
 corn, 27.
 sorghum, 30.
 aphanidermatum, radish, 75.
 ultimum, sweet potato, 70.

R

Ramularia armoraciae, horseradish, 74.
 pastinacae, parsnip, 86.
 vallisumbrosae, *Narcissus* spp., 115.
 Red blade (nutritional disturbance),
 oats, 26.
 Red leaf (virus), rhubarb, 88.
 Red suture (virus), peach, 45.
Rhizina inflata, Redpine, 105.
Rhizoctonia, strawberry, 51.
 tobacco, 91.
Rhizoctonia sp., *Alyssum* spp., 106.
 beet, 85.
 cabbage, 72.
 Centaurea cyanus, 108.
 Daphne sp., 110.
 Dianthus caryophyllus, 110.
 grass, 38.
 lettuce, 82.
 Pelargonium spp., 115.
 pepper, 87.
 strawberry, 50.
 bataticola, *Lupinus mutabilis*, 114.
 soybean, 36.
 tobacco, 92.
 crocorum, alfalfa, 32.
 solani, *Aconitum* sp., 106.
 Calendula officinalis, 107.
 Callistephus chinensis, 108.
 Campanula medium, 108.
 Digitalis purpurea, 110.

- Rhizoctonia solani*, *Lupinus* spp., 114.
Petunia hybrida, 115.
Robinia pseudoacacia, 104.
 sweet potato, 70.
Rhizopus sp., *Narcissus* spp., 115.
Sempervivum spp., 117.
Rhizopus spp., squash, 79.
Rhynchosporium secalis, barley, 23.
Rhytisma acerinum, *Acer* spp., 102.
 silver maple, 102.
 punctatum, *Acer spicatum*, 102.
 solidaginis, *Solidago* spp., 118.
 Ring spot (virus), alfalfa, 33.
 Dahlia spp., 110.
 Paeonia spp., 115.
 sweet clover, 35.
 tobacco, 90.
 tomato, 66.
 Root cankers, parsnip, 87.
 Root rot, sweet corn, 30.
 (undet.), apple, 42.
 pepper, 87.
 Root rots, bean, 68.
 strawberry, 50.
 Rosette, Persian walnut, 57.
 Rosette (virus), peach, 46.
 Rough-bark, pear, 44.
 Russetting, parship, 87.
 pear, 44.

S

- Sand drown, cotton, 94.
 Scald, apple, 42.
Sclerotinia sp., swiss chard, 89.
Sclerotinia spp., lettuce, 82.
 fructicola, cherry, 48.
 peach, 45.
 plum, 47.
 gladioli, *Gladiolus* sp., 111.
 minor, lettuce, 83.
 sclerotiorum, *Antirrhinum majus*,
 106.
 bean, 68.
 cabbage, 73.
 carrot, 86.
 cauliflower, 74.
 celery, 82.
 cucumber, 78.
Sclerotinia sclerotiorum, *Delphinium*
 spp., 110.
 lettuce, 82.
 potato, 61.
Senecio cruentus, 117.
Sinningia speciosa, 117.
 strawberry, 51.
 sunflower, 39.
 tomato, 66.
Zinnia elegans, 119.
 trifoliorum, alfalfa, 32.
 clover, 34.
Sclerotium sp., *Narcissus* spp., 115.
 delphinii, *Aconitum* sp., 106.
Delphinium spp., 110.
Echinops sp., 110.
Iris xiphium, 112.
Lilium spp., 114.
Lobelia sp., 114.
Penstemon spp., 115.
Phlox spp., 116.
Physostegia sp., 116.
Zinnia elegans, 119.
 rhizodes, grass, 38.
 rolfsii, apple, 41.
 bean, 68.
 cantaloupe, 77.
Paeonia spp., 115.
 peanut, 95.
 pepper, 87.
 potato, 61.
 soybean, 36.
 strawberry, 51.
 tobacco, 92.
 tomato, 66.
 Seedling blights, barley, 23.
Septobasidium retiforme, pear, 44.
Septoria sp., *Chrysanthemum hortorum*,
 109.
 grass, 38.
Septoria spp., celery, 80.
 azaleae, *Azalea hinodegiri*, 107.
Azalea indica, 107.
Chrysanthemella, *Chrysanthemum*
 hortorum, 109.
 cucurbitacearum, cantaloupe, 77.
 euonymi, *Euonymus japonicus*, 111.
 gladioli, *Gladiolus* sp., 111.
 lactucae, lettuce, 83.

Septoria lycopersici, tomato, 63.
 nodorum, wheat, 19.
 petroselini, parsley, 86.
 pisi, Austrian winter pea, 35.
 pea, 84.
 trifoliorum, clover, 34.
 tritici, wheat, 19.
 Shelling, grape, 49.
 Slime flux, *Aesculus* spp., 102.
 Quercus alba, 104.
 Quercus rubra, 104.
 Smut, sorghum, 30.
 Soft rot, *Sempervivum* spp., 117.
 Sorosporium reilianum, corn, 26.
 sorghum, 30.
 Spaceloma ampelinum, see *Elsinoe ampelina*, 49.
 fawcettii, grapefruit, 56.
 lemon, 56.
 lime, 56.
 orange, 56.
 tangelo, 56.
 tangerine, 56.
 rosarum, *Rosa* spp., 117.
 violae, *Viola* spp., 118.
 Sphacelotheca sorghi, sorghum, 30.
 Sphaeropsis sp., Japanese maple, 102.
 Quercus spp., 104.
 Rhododendron spp., 116.
 ulmicola, *Ulmus* spp., 105.
 Sphaerotheca sp., *Kalanchoe coccinea*, 112.
 Lycium sp., 114.
 humuli, raspberry, 52.
 Rosa spp., 117.
 strawberry, 50.
 mors-uvae, gooseberry, 54.
 pannosa, *Phlox* spp., 116.
 Spindle tuber, potato, 62.
 Sporocybe azaleae, *Azalea* spp., 107.
 Sporodesmium scorzonerae, salsify, 88.
 Sporonema oxycocci, cranberry, 55.
 Sporotrichum poae, *Dianthus caryophyllus*, 110.
 Spotted wilt (virus), tomato, 66.
 Zantedeschia aethiopica, 119.
 Spray burn, bean, 69.
 Spur injury, apple, 42.
 Stagonospora curtisii, *Hippeastrum* sp., 111.

Stagonospora curtisii, *Narcissus* spp., 115.
 Nerine sarniensis, 115.
 Stalk rot, sweet corn, 30.
 Stem rots, bean, 68.
 Stemphylium solani, tomato, 67.
 Stereum gausapatum, oak, 98.
 Quercus spp., 104.
 Quercus alba, 98.
 Quercus coccinea, 98.
 Quercus prinus, 98.
 Quercus rubra, 98.
 Quercus velutina, 98.
 Sterile heads (frost injury), oats, 26.
 Stilbum cinnabarinum, fig, 57.
 Stoniness, pear, 44.
 Storage rot, cranberry, 55.
 sweet potato, 70.
 Straighthead (non-par.), rice, 31.
 Streak (virus), blackberry, 54.
 pea, 84.
 raspberry, 53.
 tomato, 66.
 Stunt (virus), *Delphinium* spp., 110.
 Sunscald, bean, 69.
 onion, 71.
 pepper, 88.
 potato, 63.
 tobacco, 92.
 tomato, 67.

T

Taphrina coerulescens, *Quercus* spp., 104.
 farlowii, cherry, 48.
 virginica, *Ostrya virginiana*, 103.
Thielavia basicola, *Kalanchoe coccinea*, 112.
 tobacco, 90.
Thielaviopsis paradoxa, coconut, 58.
Tilletia sp., *Agropyron cristatum*, 37.
 anthoxanthi, *Anthoxanthum odoratum*, 37.
 decipiens, *Agrostis palustris*, 37.
 horrida, rice, 31.
 levis, wheat, 17.
 tritici, wheat, 17.
 Tipburn (non-par.), cabbage, 73.
 lettuce, 83.
 potato, 62.

Trabutia erythrospora, live oak, 104.
Tranzschelia pruni-spinosae, cherry, 48.
 punctata, see *T. pruni-spinosae*.
Tubercularia sp., *Rosa* spp., 116.
 vulgaris, *Acer pseudoplatanus*, 102.
 Japanese maple, 102.
 Tubers without tops, potato, 63.
 Twig blight, Persian walnut, 57.
Tylenchus penetrans, see *Anguillulina*
 pratensis.

U

Uneven ripening, grape, 49.
Uredo behnickiana, *Cattleya* sp., 108.
Urocystis cepulae, onion, 71.
 occulta, rye, 21.
 tritici, wheat, 17.
Uromyces appendiculatus, see *U. phaseo-*
 li typica.
 caryophyllinus, *Dianthus caryophyl-*
 lus, 110.
 fabae, pea, 84.
 lespedezae-procumbentis, *lespedeza*,
 37.
 medicaginis, alfalfa, 33.
 minor, *Trifolium eriocephalum*, 34.
 phaseoli typica, bean, 68.
 trifolii fallens, *Trifolium pra-*
 tense, 34.
 trifolii hybridii, *Trifolium*
 hybridum, 34.
 trifolii trifolii-repentis, clover,
 34.
Urophlyctis alfalfae, alfalfa, 33.
Ustilago avenae, oats, 24.
 hordei, barley, 21.
 hypodytes, grass, 38.
 Oryzopsis hymenoides, 38.
 levis, oats, 24.
 medians, barley, 22.
 nuda, barley, 21.
 rabenhorstiana, *Digitaria*
 sanguinalis, 38.
 striaeformis, grass, 38.
 tritici, wheat, 17.
 zeae, corn, 26.
 sweet corn, 29.

V

Valsa pauperata, *Acer dasycarpum*, 102.
 Variegations (virus), apple, 42.
Venturia sp., *Cotoneaster* spp., 109.
 inaequalis, apple, 39.
 pyrina, pear, 43.
 pyrina pyracanthae, *Pyracantha*
 lalandi, 116.
Verticillium sp., *Aconitum* sp., 106.
 Antirrhinum majus, 106.
 Azalea spp., 107.
 Berberis thunbergii, 107.
 Callistephus chinensis, 108.
 Chrysanthemum hortorum, 109.
 eggplant, 86.
 elm, 100.
 Erigeron sp., 110.
 Phlox spp., 116.
 Senecio cruentus, 117.
 silver maple, 102.
 sugar maple, 102.
 Ulmus spp., 105.
 alboatrum, *Acer* spp., 102.
 cotton, 94.
 Liatris sp., 113.
 potato, 61.
 raspberry, 53.
 tobacco, 92.
 tomato, 64.
 dahliae, *Dianthus caryophyllus*, 110.
 Japanese maple, 102.
 Norway maple, 102.
 wilt, maple, 97.
 Virescence, alfalfa, 33.
 Virus diseases, potato, 61.
Volutella buxi, see *Nectria rousseliana*.

W

Water core (non-par.), apple, 42.
 Weather injury, grape, 49.
 strawberry, 51.
 Western yellow blight, see curly top.
 Whiptail (non-par.), cauliflower, 74.
 White spot (non-par.), alfalfa, 33.
 Wilt (undet.) *Cupressus* spp., 105.
 Wind injury, grape, 49.
 Winter injury, *Acer* spp., 102.

Winter injury, alfalfa, 33.
 apple, 42.
 Buxus spp., 107.
 cherry, 48.
 Madonna lily, 114.
 peach, 47.
 raspberry, 53.
 Rhododendron spp., 116.
 Rosa spp., 117.
 rye, 21.
 Taxus spp., 105.
 Thuja spp., 105.
 Weigela spp., 119.
 Winter killing, Ligustrum spp.,
 113.
 Witches broom, alfalfa, 33.
 potato, 62.
 strawberry, 51.

X

Xylaria sp., apple, 41.

Y

Yellow dwarf, potato, 62.
 Yellowing, bean, 69.
 spinach, 89.
 Yellows (hopper injury), alfalfa, 33.
 Yellows (virus), Calendula officinalis,
 107.
 Callistephus chinensis, 108.
 carrot, 86.
 Chrysanthemum hortorum, 109.
 Helichrysum spp., 111.
 lettuce, 83.
 peach, 45.
 salsify, 88.
 strawberry, 51.
 Tagetes erecta, 118.

Z

Z disease, potato, 63.

1877

